ORDER NO. AD9604096C8

Service Manual

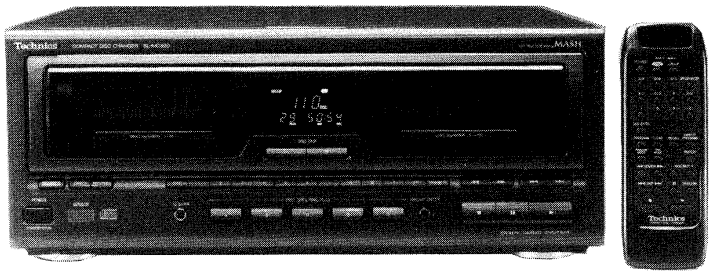
COMPACT disc DIGITAL AUDIO

MASH* multi-stage noise shaping

※ MASH is a trademark of NTT.

Compact Disc Changer

SL-MC400



Colour

(K)...Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

RAE0150Z MECHANISM SERIES

■ Specifications

■ AUDIO

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	92 dB
S/N	100 dB
Total harmonic distortion	0.007% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	* MASH (1 bit)
Output impedance	Approx.1 kΩ
Load impedance	More than 10 kΩ

■ PICKUP

Wavelength	780 nm

■ GENERAL

Power consumption	14 W GC only 17 W
Power supply	
for continertal Europe and Australia	AC 50/60 Hz, 230 ~240 V
for others	AC 50/60 Hz, 110 V/127 V/220 V/230~240 V
Dimensions (W×H×D)	430×170×387 mm
Weight	7.0 kg

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Before Repair

(1) Turn off the power supply using a 10Ω, 10 W resistor, connect both ends of power supply capacitors (C12, C21, C22) in order to discharge the voltage.

(2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 240 V/110 V/120 V/220 V/230~240 V.

Power supply voltage	AC 240 V	AC 110 V	AC 120 V	AC 220 V	AC 230~240 V
Consumed current 50 Hz	30~45 mA	80~100 mA	70~90 mA	30~50 mA	35~55 mA

Protection Circuitry

The protection circuitry may have operated if either of the following conditions is noticed:

* No sound is heard when the power is switched ON.
* Sound stops during a performance.

The function of this circuitry is prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1. Switch OFF the power.
2. Determine the cause of the problem and correct it.
3. Switch ON the power once again.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Precaution of Laser Diode

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780 nm
Maximum output radiation power from pickup: 100 μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

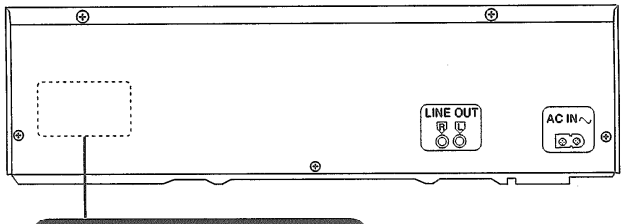
1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

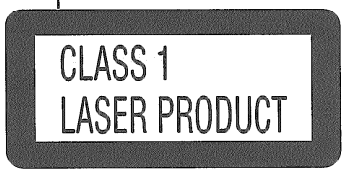
ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Leserstrahlung von der Lasereinheit abgestrahlt.

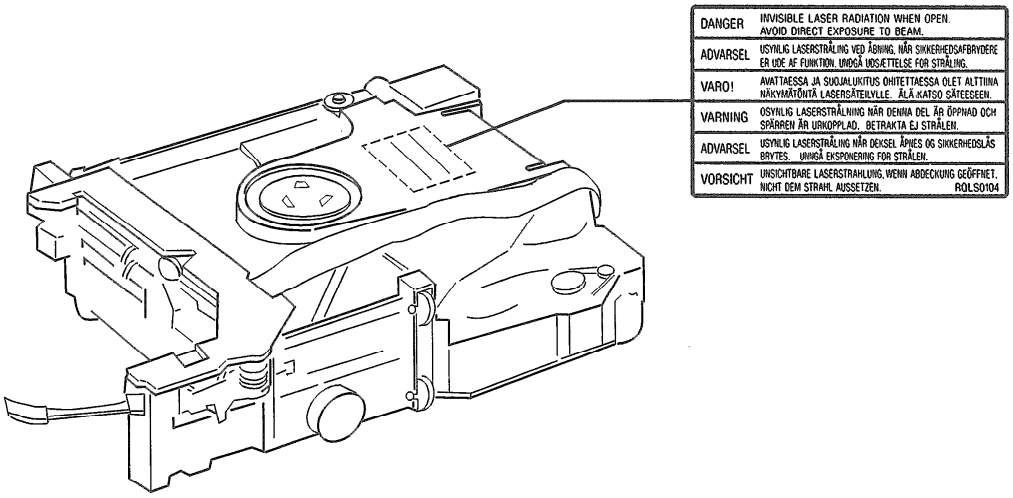
Wellenlänge: 780 nm
Maximale Strahlungsleistung der Lasereinheit: 100 μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinhit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlines blicken.

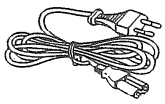




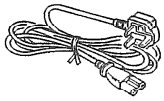

DANGER INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO! AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
RQLS0104

Accessories

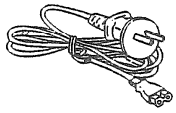
- AC power supply cord
  (E, EG,GC) areas : (RJA0019-2K).....1



(EB) area : (RJA0049-K).....1

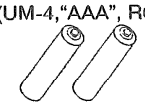


(GN) area : (RJA0036-K).....1



- Remote control transmitter
  (RAK-SL186WH) 1

Batteries for remote control transmitter.....2 pcs.
(UM-4,"AAA", R03)



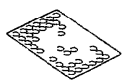
- Power plug adaptor [for (GC) area only]
  (SJP5213-2).....1

Note: These are avilable on sales route.

Stereo connection cable.....1 pc.
(SJP2249-3)

Notebook-like binder.....1 pc.
[Liner notes organizer]
(RFA0623-K1)

Adhesive number.....1 pc.
(RQLA0326)



■Caution for AC Main Lead

[For (EB) area only.]

For your safety, please read the following text carefully.

This applicance is supplied with a moulded three pin mains plug for your safety and convenience.
Ad 5-ampere fuse is fitted in this plug.
Should the fuse need to be replace please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.
Check for the ASTAd mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

CAUTION!
IF THE FITTED MOULDED PLUG IS UNSUITABLED FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFETY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT

The wire in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

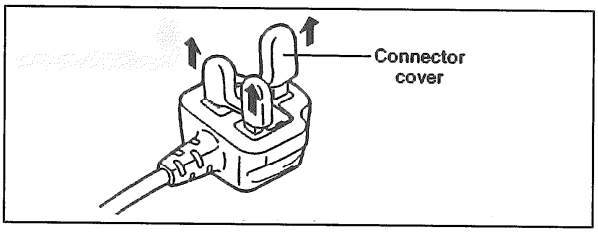
This apparatus was produced to BS 800.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol

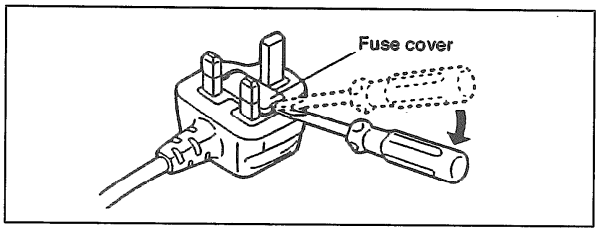
Before use

Removal the connector cover as follows.

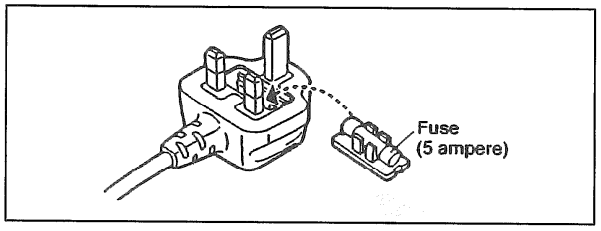


How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



■Connections

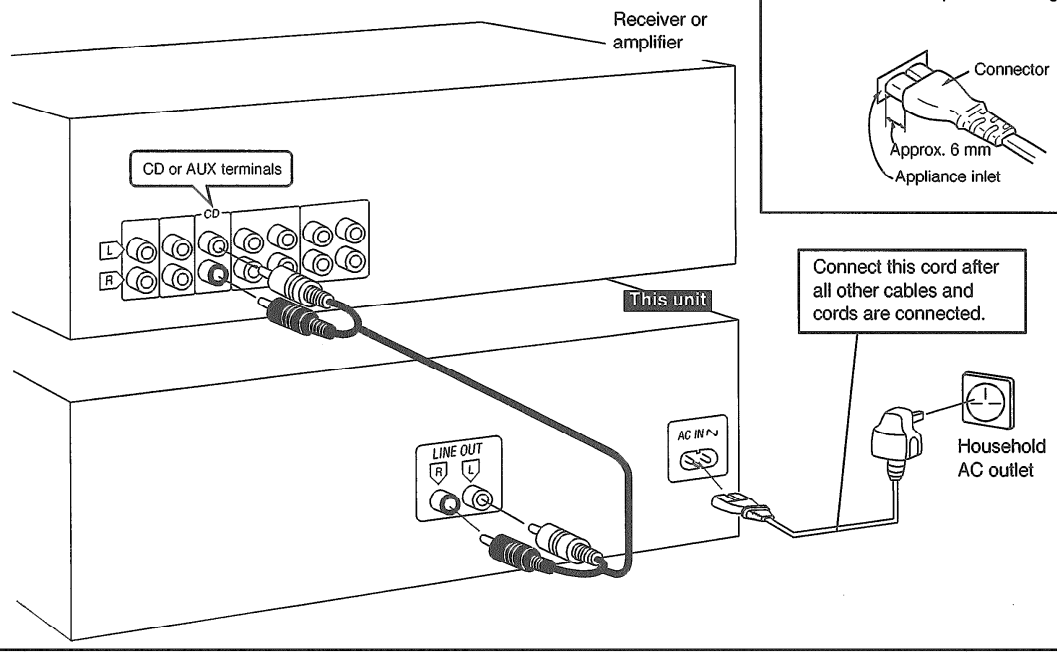
Before connecting the changer to your audio system, make sure that the power of the changer and all other system components is turned off.

- Although the figure below shows the AC power supply cord being connected to a household AC outlet, if the amplifier (or receiver) is equipped with an AC outlet, connect the cord to that outlet.
- The configuration of the AC outlet differs according to area.

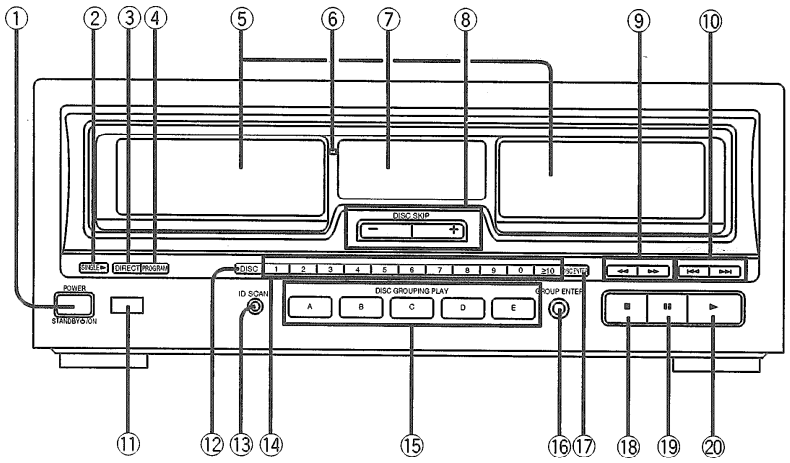
(For United Kingdom only)
BE SURE TO READ THE CAUTION FOR AC POWER SUPPLY CORD ON PAGE 3 BEFORE THE FOLLOWING CONNECTIONS.

Stereo connection cable
White (L)
Red (R)

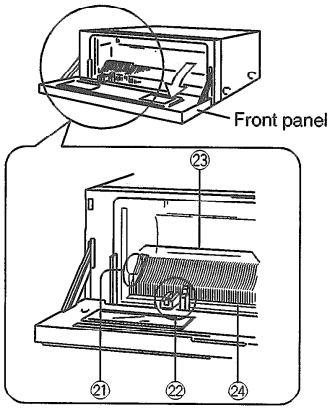
(For areas except Australia and N.Z.)
Insertion of Connector
Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing.
However there is no problem using the unit.



■Front Panel Controls

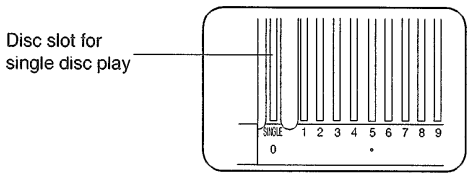


Note
For an explanation on how to open the front panel, see p. 7 "How to set discs".



No.	*Name*	*Ref. page*
①	**Power "STANDBY ⏻/ON" switch (POWER, STANDBY ⏻/ON)** Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.	*8*
②	**Single disc play button (SINGLE ▶)**	*9*
③	**Direct programming button (DIRECT)**	*13*
④	**Programming button (PROGRAM)**	*12*
⑤	**Windows**	–
⑥	**"STANDBY" indicator (STANDBY)** When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.	–
⑦	**Display**	–
⑧	**Disc skip buttons (DISC SKIP –/+)**	*16*
⑨	**Search buttons (◀◀ , ▶▶)**	*15*
⑩	**Track skip buttons (⏮ , ⏭)**	*16*
⑪	**Remote control signal sensor**	–
⑫	**Disc selector button (DISC)**	*9*
⑬	**ID scan button (ID SCAN)**	*17*
⑭	**Numeric buttons (1–9, 0, ≥10)**	*9*

No.	*Name*	*Ref. page*
⑮	**Disc group buttons (DISC GROUPING PLAY,A,B,C,D,E)**	*10*
⑯	**Group enter button (GROUP ENTER)**	*10*
⑰	**Disc enter button (DISC ENTER)**	*12*
⑱	**Stop button (■)**	*8*
⑲	**Pause button (⏸)**	*8*
⑳	**Play button (▶)**	*8*
㉑	**Disc slot for single disc play (SINGLE)**	*9*
㉒	**Loader carriage**	*7*
㉓	**Disc slots**	*7*
㉔	**Slot numbers**	*7*



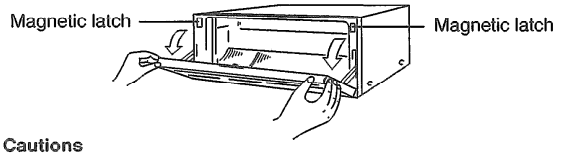
■Setting/Removing Discs

Special notes

- You can set discs in the slots and remove them too, while playing discs.
- Never set a disc in the slot of the disc being played.
- Sometimes the front panel cannot be opened while a disc is playing. It is a question of time. In such case, wait until you can open it.

How to set discs

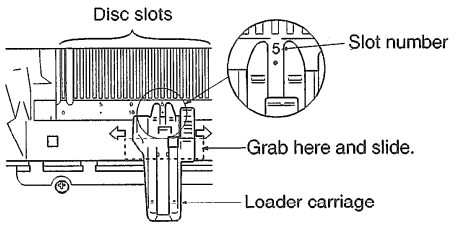
1. Pulling gently from both ends, open the front panel.



Cautions

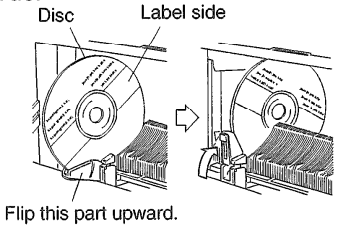
- Except when setting or removing discs, keep hands out of the changer while open. You could injure yourself if somehow entangled in the internal mechanism.
- Keep cassette tapes away from the magnetic latches.

2. Slide the loader carriage to the slot you want. You can read the numbers between the prongs as shown below.



Note
Slot No. 0 (SINGLE) is reserved for single disc play (p. 9).

3. Set the disc on the loader and flip the loader upwards.



Cautions

- Do not use 8 cm discs fitted with expander rings. Expander rings could damage the disc slots.
- Do not use cleaning discs, discs with stickers on the label side or warped discs. All of these could damage your changer.
- Do not put anything other than discs in the changer.
- Do not set a disc in the slot of the disc being played (slot flashes). The disc in play is returned to its slot when finished. If two discs somehow jam the slot, one or both could be damaged. When this happens, the message "TAKE OUT" will appear on the display. Remove the disc that doesn't belong in the slot and press the stop button.
- Do not open the front panel while the changer is changing discs.

Note

- Set discs with the label facing to the right.
- Never load more than one disc in any given slot.

4. Gently close the front panel.

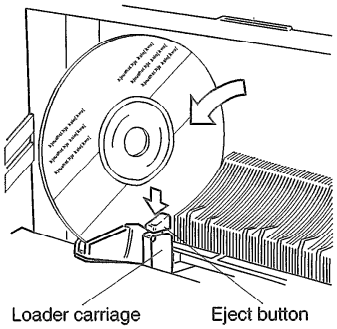
Note
If you leave the front panel open while a disc is in play, when the disc is over, the changer will stop.

How to remove discs

1. Open the front panel.

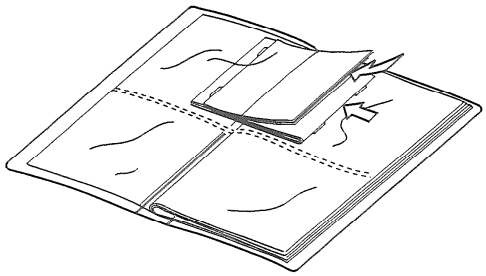
2. Slide the loader carriage to the slot you want.

3. Press the eject button on the loader carriage.

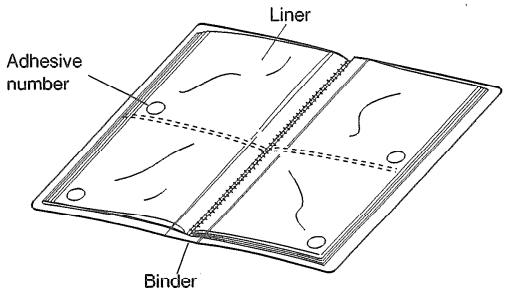


How to know what disc is in what slot

Your changer comes with a notebook-like binder (liner notes organizer) in which you can keep your CD liners. There are also adhesive numbers for indicating slot numbers in the binder. This is a convenient way to keep track of what disc is in what slot.



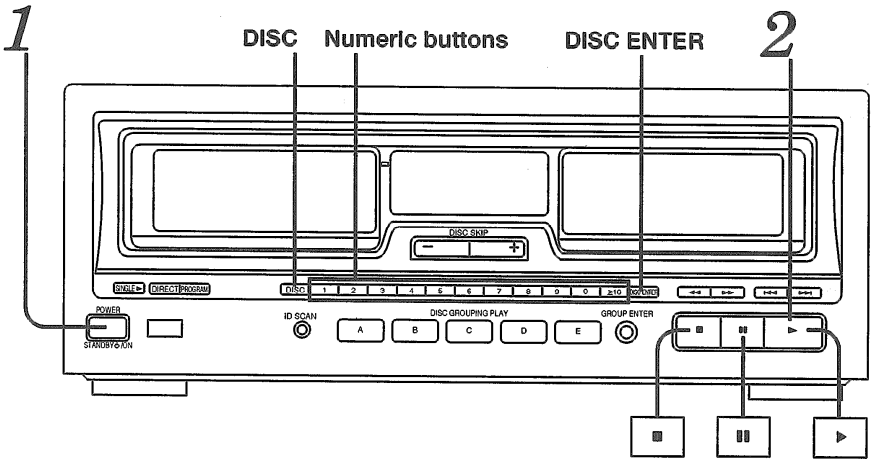
Put two liners back-to-back inside each pocket, as shown above.



■Basic Operations

Sequential play

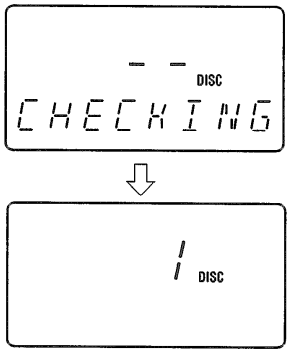
The changer plays all the tracks on all the discs in order and stops automatically when the last track on the last disc finishes playing.



Before starting, load your discs (see p. 7).

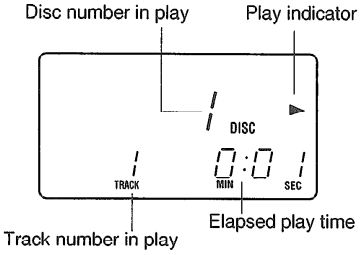
1 POWER

Press POWER.
The unit will switch on.
Momentarily, the message "CHECKING DISCS" will appear on the display.
When it goes out, the last disc played will be displayed.



2

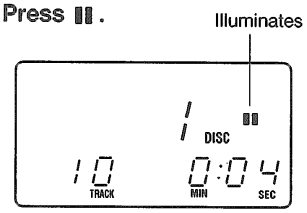
Press ▶.
Play will begin.



Note
The disc number is the same as the slot number.

To temporarily stop play

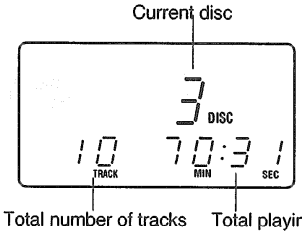
Press ▮▮.



Press ▶ to resume play.

To stop play

Press ■.
The display will show the total number of tracks and the total playing time of the current disc.

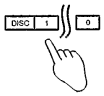


The total playing time displayed includes the silent sections between tracks. For this reason, it may be a few seconds longer than the playing time indicated on the disc.
When you open the front panel, the total number of tracks and the total playing time go out.

Press ▶ to re-start play.

Note
It takes roughly 3 seconds from the time you press ■ until the disc is returned to the slot.

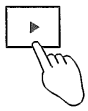
To directly access a specific disc



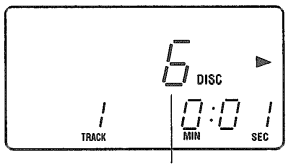
Select the disc you want with the numeric buttons.

To select a disc from 1 to 9
For example: "6"
DISC → 6

(Press within 7 seconds.)



Press ▶.



Disc number

The changer will start playing the selected disc from the first track.

To select a disc from 10 to 110
For example: "109"
DISC → 1 → 0 → 9

(Press within 7 seconds.)

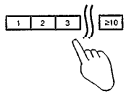
Press ▶.

Note
When selecting discs, the ≥ 10 button does not respond to touch.

For your reference

- If you press DISC ENTER instead of ▶ to select a disc, the disc number will be displayed but play will not start automatically.
- When in the stop mode, if you select an empty slot, the message "NO DISC" will appear on the display.
- While a disc is playing, if you select an empty slot, the changer will automatically play the next disc available.
- If you select "0", the changer will switch to the single disc play mode (See the right side of this page.).

To directly access a specific track

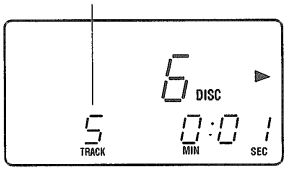


After selecting a disc, select a track with the numeric buttons.

Press the numeric button(s) to select the track.

Play will begin from the selected track.

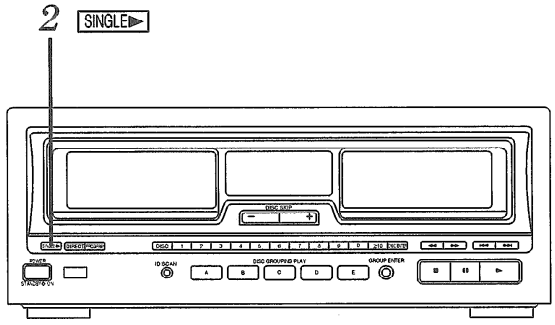
Track number



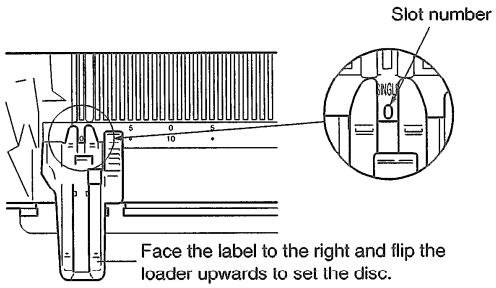
To select a track between 1 and 9:
Press the corresponding numeric button.
To select a two-digit track number 10 or higher:
First press ≥ 10, and then press the numbers for the two digits
For example; number 20:
Press ≥ 10, then 2, and then 0.

■Single Disc Play

Single disc play is for that special disc of yours, perhaps one you just bought. You see, the changer has a slot for one special disc which you can use even when the rack is full (max. 110 discs).



1 **Open the front panel, and set the disc in the slot No. 0.**

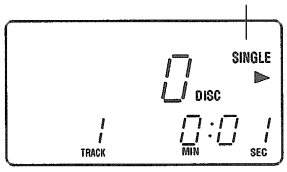


Face the label to the right and flip the loader upwards to set the disc.

2 SINGLE▶ **Close the front panel and press SINGLE ▶.**

The disc will start playing from the first track.

Illuminates



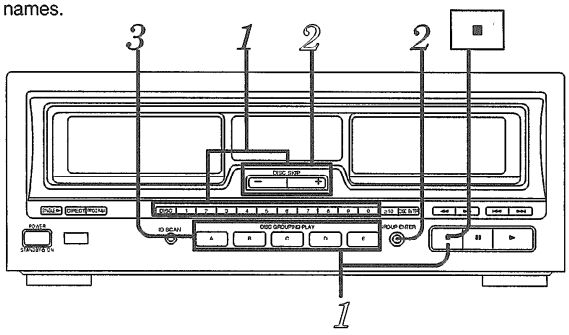
The changer plays all the tracks in order and stops automatically when the last track finishes playing.

To cancel single disc play mode

- Select another disc with the numeric buttons.
- Skip to another disc with DISK SKIP –/+. (See p. 16)
- Select a group. (See p. 10)

■Disc Grouping Play

Sometimes, you want to block off your CDs into groups. For example, by the type of music, or your favorite CDs, etc. Well, this changer lets you make up to five groups, A through E. Basically, it's like dropping a disc into a box, then playing just discs from that box. What's more, you can name the groups with any of the preset names.



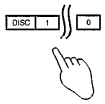
To make groups

- Any single group can hold up to 110 CDs.
- You can enter the same CD into as many of the 5 groups, A through E, as you like.
- You can assign any one of the preset names to a registered group (see step 2 on p. 11). We recommend that you name your groups by the type of discs you put in them.

1

(During sequential play or while it is on stop)

Select a disc.



• Using the numeric buttons

To select a disc from 1 to 9

For example: "6"

DISC → 6

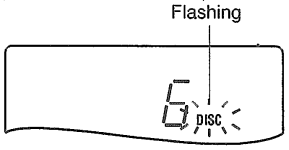
(Press within 7 seconds.)

To select discs from 10 to 110

For example: "109"

DISC → 1 → 0 → 9

(Press within 7 seconds.)



• Using DISC SKIP –/+

Press either DISC SKIP – or + until reaching the disc you want.

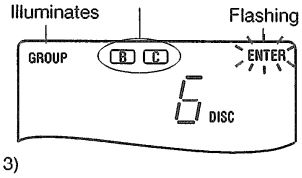
Note

You cannot select slot No. 0.

2

Press GROUP ENTER.

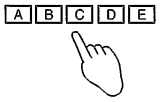
If any groups have been registered already, their letters will light up.



(Perform step 3)

You have to select a group within 7 seconds from when the indication "ENTER" starts flashing on the display. Unless you do so, the changer will return to the way it was before you pressed GROUP ENTER.

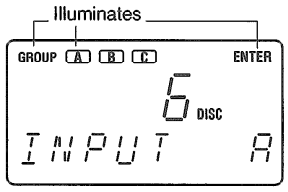
3



Press the DISC GROUPING PLAY button(s) you want. (This "INPUT" the disc in the group.)

For example: To input disc No. 6 in group A.

Press A.



To enter the same disc into different groups

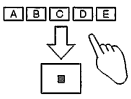
Repeat steps 2 and 3 selecting the specific groups.

4

Repeat steps 1, 2 and 3 until you have completed all items.

To check what discs are in what groups

1



(During sequential play or while it is on stop)

Press the DISC GROUPING PLAY button you want and then press ■.

2

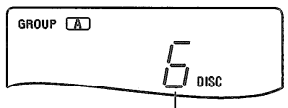
Press either DISC SKIP (– or +).

Every time you press DISC SKIP, the next disc number in order is displayed.

– : Numbers progress in reverse order.

+ : Numbers progress in regular order.

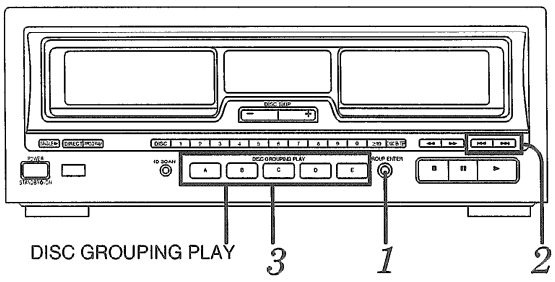
Example



Disc number of disc registered in group A

Note

After checking, if you press the button of a group that is lit on the display, the changer reverts back to sequential play but does not automatically start playing the group.



To name groups

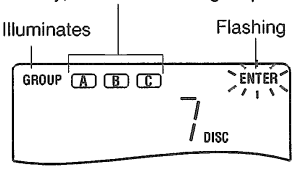
You can name your groups. The changer has several preset names to choose from.

1 GROUP ENTER

(During sequential play or while it is on stop)

Press GROUP ENTER.

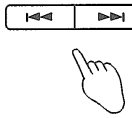
If any groups have been registered already, their letters will light up.

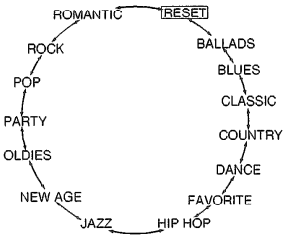


2 (Press within 7 seconds.)

Select the name you want with ◀◀ and ▶▶.

Names change in rotation as shown below, every time you press ◀◀ or ▶▶.





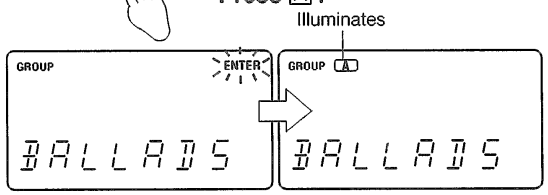
3 (Press within 7 seconds.)

Press the DISC GROUPING PLAY button for the group you want to name.

A B C D E

For example: To name group A

Press A.



The above example shows when "BALLADS" has been selected.

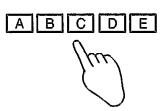
4 **Repeat steps 1, 2 and 3 to name other groups.**

To cancel names

Select "RESET" in step 2 and then the name of the group you want to cancel in step 3. Thereafter, the group will appear as "GROUP ... (A,B,C,D or E.)".

To start play

Unless otherwise specified, the changer selects sequential play.

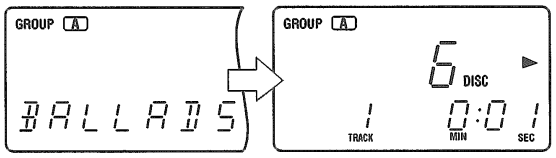


(During sequential play or while it is on stop)

Press the DISC GROUPING PLAY button of the group you want.

For example: To hear group A

Press A.



Notes

- Unnamed groups will be displayed as "GROUP A, B, C..." and so forth. In the above example, "GROUP A" appears in the place of "BALLADS".
- If you press the group button of a group which has no discs registered in it, the message "NO INPUT" will appear on the display.

To cancel group play

(In the stop mode)

Press the DISC GROUPING PLAY button indicated on the display.

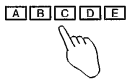
(The group indication on the display will go out.)

For your reference

The group contents will remain stored in memory even after the unit is switched off.

However, if the power cord is unplugged or the power supply is otherwise interrupted for an extended length of time, the contents will be erased from memory.

To cancel discs from groups

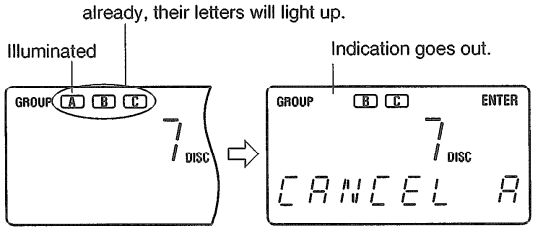


Perform steps 1 and 2 shown on page 10, and then in step 3, press the DISC GROUPING PLAY button(s) you want.

For example: To cancel disc No. 7 from group A.

Press A.

If any groups have been registered already, their letters will light up.

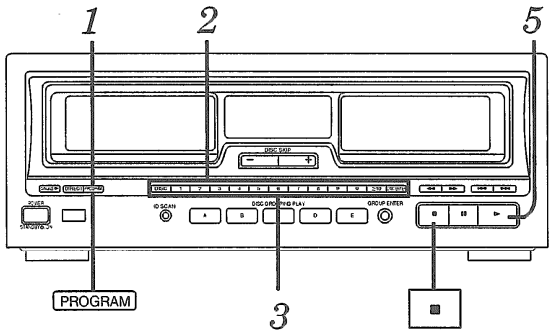


You can cancel a disc from two or more groups at one time, provided it has been entered in each of the groups, of course.

Press ■ in step 3 on page 10. (In the stop mode)

■Program Play

Everyone has his/her favorite tracks. You can program the changer to play them in a specific order. With this changer, you can make one program and fill it with up to 32 selections from any of the discs in the rack.



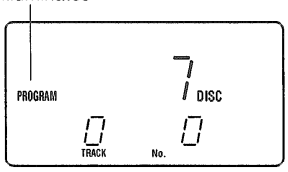
1

PROGRAM

[In the stop mode]

Press PROGRAM.

Illuminates



2

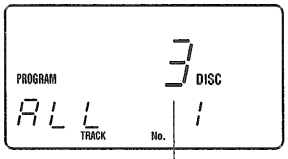
DISC 1 ≥10 DISC ENTER

Select the disc(s) you want with the numeric buttons.

For example:

To select disc 3.

DISC → 3 → DISC ENTER



Specified disc number

The "ALL" indication shows that all the tracks on the disc are selected.

To program by means of disc numbers only, repeat the above operation. (The count will increase by one for each operation.)

You can select slot No. 0.

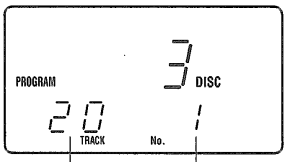
3

1 2 3 ≥10

Press the numeric button(s) to specify the track.

For example:

To select track No. 20, press ≥10, then 2, and then 0.

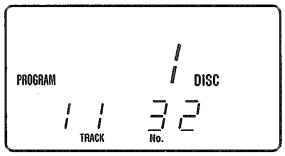


Specified track number Program order

4

Repeat steps 2 and 3 until you have completed all entries.

If you enter non-existing disc(s) or track(s), the corresponding indicator illuminates and the entry is included in the count. In the play mode, the changer will cancel the non-existing entry.



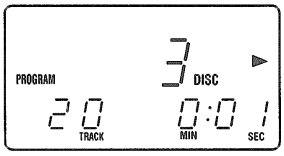
If you attempt a 33rd selection, the "PGM FULL" indication will be displayed.

5

▶

Press ▶ to start play.

To enter additional selections during play, repeat steps 2 and 3.



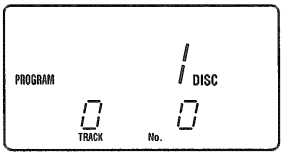
To clear all programmed contents

■

[In the stop mode]

Press ■.

The display will look as below.



To quit the program mode

PROGRAM

[In the stop mode]

Press PROGRAM.

The changer will return to the sequential play mode.

The programmed contents will remain stored in memory until they are cleared, even after the program mode is canceled.

Therefore, after program, it is possible to cancel the program mode and use another play mode and then hear the same program again at a later time.

In addition, if discs are changed, the program will be played using the new discs. If non-existing entries are found at this time, the changer will cancel them.

For your reference

The program will remain stored in memory even after the unit is switched off.

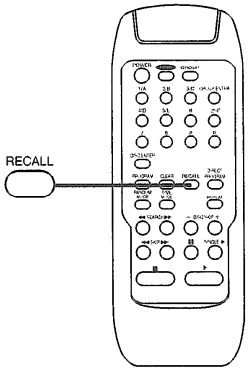
However, if the power cord is unplugged or the power supply is otherwise interrupted for an extended length of time, the contents will be erased from memory.

Special note on recording programs

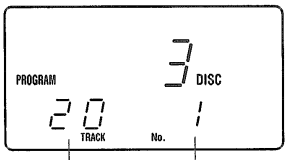
The changer needs time to change the discs and find the tracks. This time will vary depending on what you put into the program. In any case, the total playing time will be longer than that of the actual tracks.

To check programmed contents

(only available from the remote control)



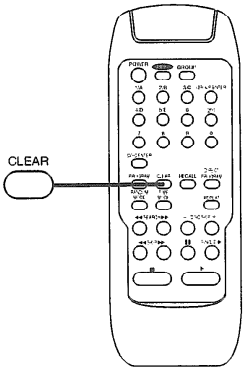
Press RECALL.
Each time you press RECALL, the display shows the programmed disc and track number in the sequence you have entered.



Programmed track — Programmed order

To clear a single item from the program

(only available from the remote control)

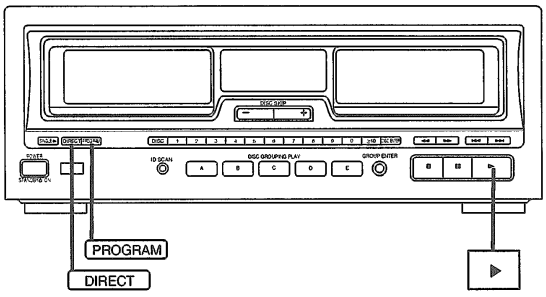


(In the stop mode)
Press CLEAR.
Each time you press CLEAR, you will cancel the last entry in the order you have entered all selections.

To clear an entry in the middle of the program sequence, press RECALL repeatedly until the display shows the selection to be cleared, and then press CLEAR within three seconds after that.

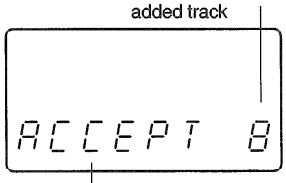
■Direct Programming

You can add the track in play to your program.
In fact, a good way to build up your program is to listen to tracks and add those you like while they are still being played. It sure makes programming easier if you listen-and-program.



(In the play mode)
Press DIRECT. (Or, press DIRECT PROGRAM on the remote control.)
The current track will be added to the tail end of the program.

Example Programmed order of the newly added track



Illuminates for about 2 seconds when DIRECT is pressed.

Returns to the original indication.

Note
When you make a program as explained under "Program play" on the left page, and then perform the above procedure without clearing the program first, the selected track is added to the end of the program.

To listen to programmed tracks

(In the stop mode)
Press PROGRAM and check "PROGRAM" appears on the display, then press ▶.
The program will start from the first track.

To clear all programmed contents.

See p. 12.

To check programmed contents.

See the left side of the page.

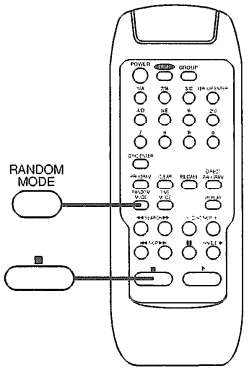
To clear a single item from the program.

See the left side of the page.

Notes
- You cannot add to the program if already full, that is, if already 32 selections have been programmed. If you press DIRECT in such case, the message "PGM FULL" will be displayed. Therefore, direct programming is possible only when 31 or less tracks have been programmed.
- During program play, the DIRECT button does not respond to touch.

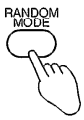
■Random Play

(Only available from the remote control)
The tracks will be played in random order. There are two types of random play as described below.

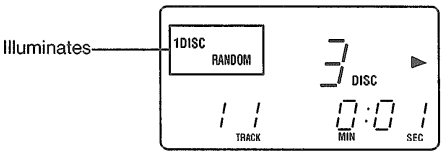


One disc random play

The changer will play all tracks on the current disc in random order. Then, it will choose a new disc randomly, excluding the discs already played, and play all tracks on that disc in random order.

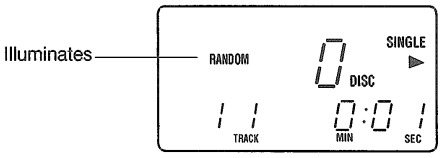


[In the stop or play mode]
Press RANDOM MODE so that the "1 DISC RANDOM" indicator illuminates.
Each time the button is pressed, the display will change in the following order: 1 DISC RANDOM → FULL RANDOM → (off).



The changer will stop automatically when all the tracks on all discs have been played once.

In the single disc play mode
Only tracks from the disc in slot No.0 are played, though played in random order.
Every time you press RANDOM MODE, the display switches between OFF and "RANDOM".

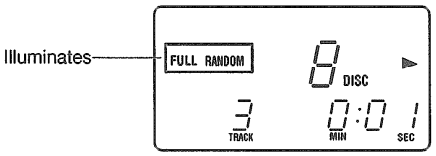


In the disc grouping play mode.
Only tracks from one of the discs, selected at randomly from all discs in the group by the changer, are played. The tracks too are played in random order.

Full random play

The changer will play tracks from all of the discs at random. However, it may choose the same track twice. In a single pass, the changer can play up to 250 tracks.

[In the stop or play mode]
Press RANDOM MODE so that the "FULL RANDOM" indicator illuminates.
Each time the button is pressed, the display will change in the following order: 1 DISC RANDOM → FULL RANDOM → (off).



Once the changer has played the maximum 250 tracks, it stops automatically.

Note
The disc in slot No.0 will not be played.

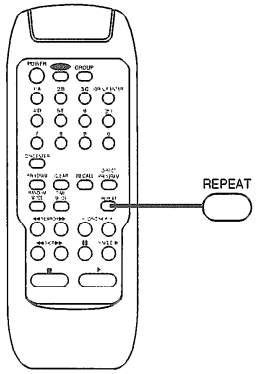
In the disc grouping play mode.
The changer selects tracks randomly from all discs in the group but not from other groups.

To cancel random play mode

Press ■.
The "1 DISC (or FULL) RANDOM" indicator will go out.

■Repeat Function

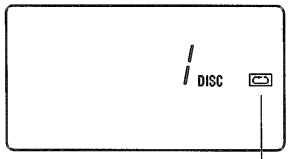
(Only available from the remote control.)
Play will continue endlessly in accordance with the specific play mode selected.



REPEAT

[Before or during play]

Press REPEAT.



Illuminates

In the sequential play mode
All tracks of all discs will be played repeatedly.

In the single disc play mode
The changer will repeatedly play all tracks on the disc in slot No. 0.

In the program play mode
The changer plays only the programmed selections in the programmed sequence repeatedly.

In the one disc random play mode
When the changer has played all the tracks on the current disc in random order. Then, it will choose a new disc randomly, excluding the discs already played, and play continuously. The sequence differs each time.

In the full random play mode
Once the changer has played the maximum 250 tracks, it will select a new random sequence and will continue playing.

To repeat the same track over and over
To repeat the programmed tracks
1. Select the desired track using the program play procedure on page 12.
2. Press REPEAT to display "↻".
3. Press ▶.

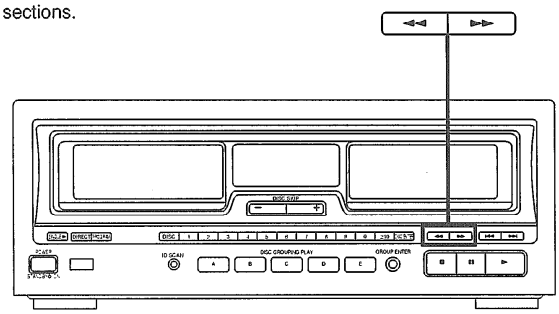
To cancel repeat mode

REPEAT

Press REPEAT again.
The "↻" indicator will go out.

■Search Function

You can search rapidly forward or backward on the disc for specific sections.



[In the play or pause mode]

Press and hold ◀◀ or ▶▶.

◀◀ : You can search backward.
▶▶ : You can search forward.

Release the button when you reach the desired point.
The changer will return to the previous mode (play or pause).

In the program/random play mode
You can search forward or backward only within the current track.

In the single disc play mode
You can search forward or backward only within the current disc.

In the sequential/disc grouping play mode
When the changer finishes searching the current disc, it starts searching the next one.

For your reference

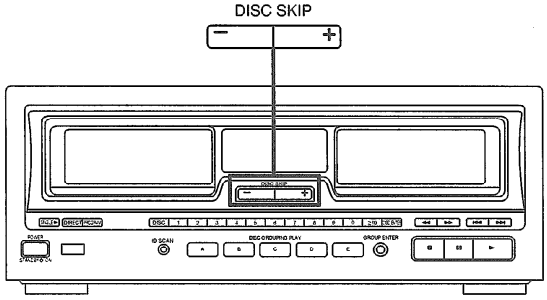
The search function will begin slowly, and then, if the button is held down for longer than 3 seconds, it will change to high-speed search.

■Skip Function

To skip discs

Use this function to skip discs when selecting a disc which you wish to listen to.

DISC SKIP

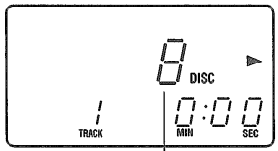


You can use this function in stop, sequential play, one disc random play and disc grouping play modes.

DISC SKIP

Press either DISC SKIP (– or +) until you reach the desired disc.
–: Skips backwards to the preceding disc.
+: Skips forward to next disc.

Note:
The changer skips over empty slots.



Disc number at the playing position

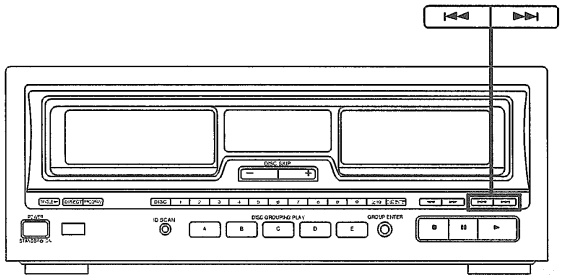
Notes
- This function does not work in the full disc random play mode or during program play.
- If you attempt to use this function during single disc play, the changer will cancel single disc play.

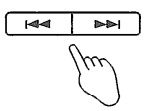
For your reference

If you press the DISC SKIP buttons intermittently, the slot Nos change slowly. If you hold the buttons down, the changer fastskips through numbers.

To skip tracks

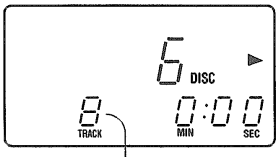
Use this function to skip tracks when selecting a track which you wish to listen to.





Press either ⏮ or ⏭ until you reach the desired track.

⏮ : You can skip backward.
⏭ : You can skip forward.



Track number at the playing position

In the sequential/single disc/disc grouping/program play mode

You can skip only within the current disc.
In the program play mode, you can skip from one track to another in the programmed sequence.

⏮ : You can skip to the beginning of the track being played. If you press this button again quickly, you can skip to the beginning of the previous track.
Remember that in a backward skip, the current track is included in the count.

⏭ : You can skip as many tracks as the number of times you press the button.

In the random play mode

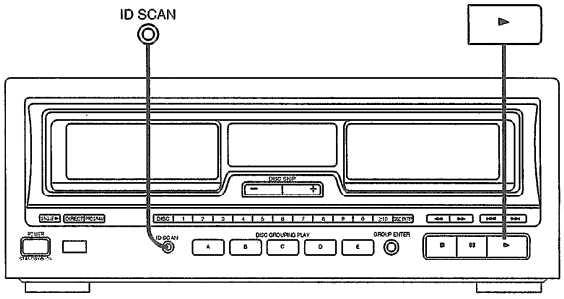
⏮ : You can skip to the beginning of the current track.

⏭ : You can skip to the beginning of a next track in the random order the changer has selected.

You can also skip tracks when the changer is in the stop mode (except during random play) or pause mode.

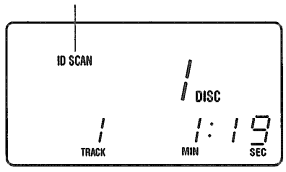
■ID Scan Function

This function is convenient to use when searching for a desired track.
The function will search from the beginning of the track for a loud section, and will play 10 seconds of the track centering around that point.
The order of scanning is the same as for play mode.

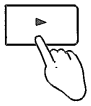


Press ID SCAN.
ID scan will start.

Illuminates



When the desired track has been found:



Press ▶.
The changer will play the track from the beginning.

To cancel ID scan

Press ID SCAN while this function is in operation.
The "ID" indicator will go out.

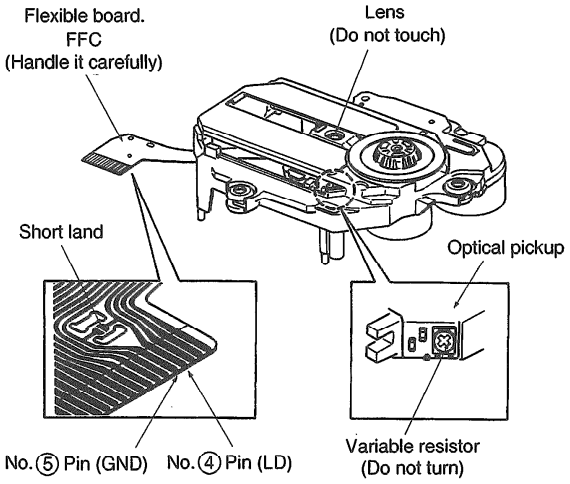
The changer will continue to play from the track being played.

■ Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. The short land between the No. ④ (LD) and No. ⑤ (GND) pins on the flexible board (FFC) is shorted with a solder build-up to prevent damage to the laser diode.
   To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

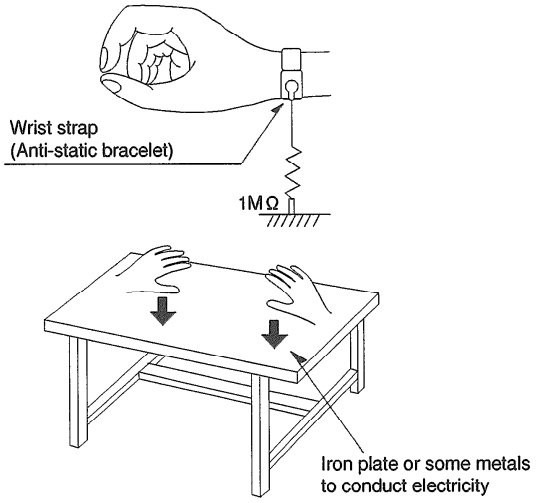


● Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

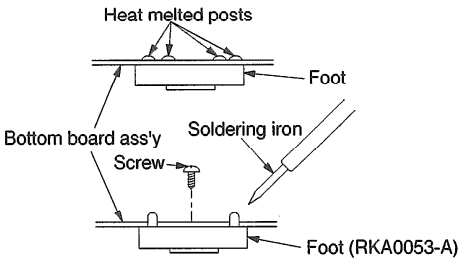
Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



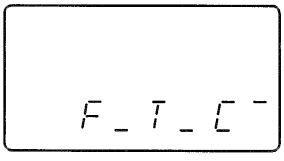
■ Replacement of the Foot

1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom board ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



Self-Diagnosis Mode

Self-diagnosis mode list

Mode	Procedure	Content	Use	Page
FL display mode	Turn ON power button with no disc loaded. ↓ Press the following 3 buttons simultaneously: PLAY(▶),STOP(■),TRACK SKIP(⏮) ↓ FL all unlit ↓ Press DISC button ↓ Press specified button ↓ FL all lit	FL all unlit / all lit	Enables checking of whether FL and each SW are okay or not, before set disassembly.	P19
Mechanical mode	Turn ON power button with no disc loaded. ↓ Hold down the STOP (■) button for at least 2 seconds. ↓ Simultaneously press the TRACK SKIP (⏭) button for at least 2 seconds,while holding down the STOP (■) button. ↓ C (Appears on display)	Displays defective points while performing a series of mechanism operations. C F-15: PU rest SW etc. C F-27: Slide drive system C F-28/ C F-29: Loading system F26: Main IC defect (Automatically displayed when power is turned ON, regardless of mode setting.)	Enables fault to be diagnosed, before set disassembly.	P20) P22
Test mode	Turn OFF power button once, with no disc loaded. ↓ Turn ON power while simultaneously holding down the following button: PLAY(▶), STOP(■) ↓ TEST MODE (Appears on display) → Press A button → Press B button Mount disc in single (slot 0) position. → Press C button	A button: Results in independent operation of traverse deck.	Use to check correct operation after disassembly.	P23
		B button: Repeats loading / unloading operation.	Use to check correct operation after repair.	P24
		C button: Automatically repeats loading / unloading / slide operation.		P25
Servo adjustment mode	After mounting disc in slot, turn OFF power button once. ↓ Turn ON power while simultaneously pressing the following three buttons: PLAY(▶),PAUSE(⏸),STOP(■) ↓ Press the PLAY(▶) button.	Displays servo circuit status on FL. 	Enables checking of servo status. * F = Focus servo * T = Tracking servo * C = CLV servo	P26 • P27

Before set disassembly

Before set disassembly, perform Self diagnosis (FL display mode and Mechanical mode) and CD basic operation checking, and develope an idea of the cause of the problem.

Self-diagnosis FL display mode

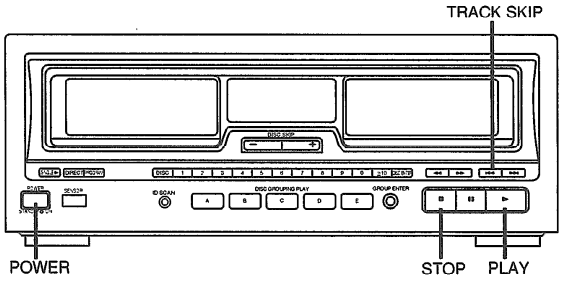
FL all unlit test

Press POWER with no disc loaded.

Press STOP(■),PLAY(▶),TRACK SKIP(◀◀) simultaneously.

FL is all unlit.

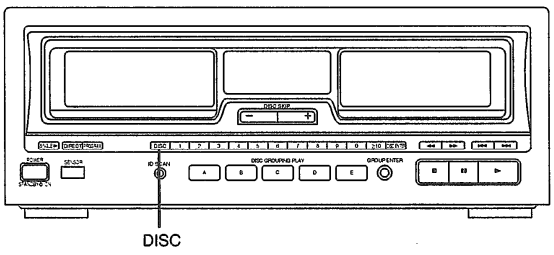
Previous display remains unchanged:
* Check switches(■ , ▶, ◀◀).
Characters remain displayed:
* Check the grid of the characters.

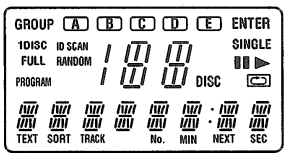


FL all lit test

Press DISC (FL remains all unlit)

Press all buttons except STOP(■), PAUSE(▮▮), PLAY(▶), SEARCH(◀◀, ▶▶), DISC, DISC ENTER and POWER.





Result	Handling
All lit	Normal (Pressed button and FL normal)
All remain unlit	Check all buttons pressed above
Missing letters	Check grid of missing letters

Cancellation

• Press STOP(■) or turn OFF/ON power button.

Self-diagnosis Mechanical mode

Setting

Turn ON the power button with no disc loaded.

↓

Loading unit moves to the right and left, and system reverts to standby mode.

↓

Hold down the STOP(■) button for at least 2 seconds.

↓

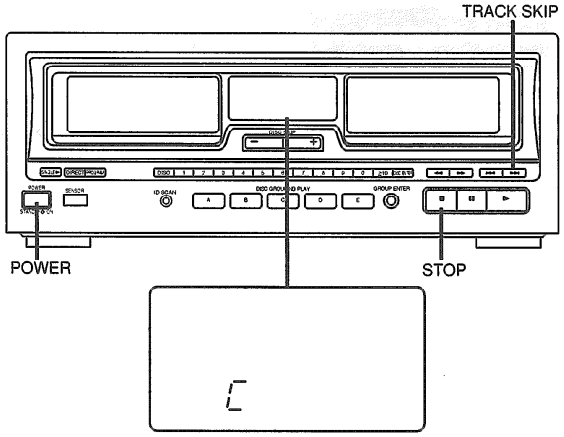
Simultaneously press the TRACK SKIP(▶▶|) button for at least 2 seconds, while holding down the STOP(■) button.

↓

"C" appears on display

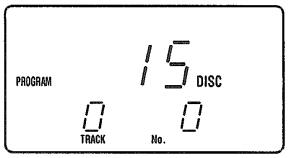
↓

Self-diagnosis starts automatically



Loading unit operation and display

		(Display)
OPU moves to rest position. YES / NO	Stops	C F-15
Moves to transport lock position. YES / NO	Stops	C F-27
Disc detection (Round trip, moving right to left) YES / NO	Stops	C F-27
Stop for 1 second at standby position. YES / NO	Stops	C F-27
Moves to slot No.15, loading operation. YES / NO	Stops	C F-27 or C F-28
Stop for 1 second in clamp state. YES / NO	Stops	C F-28
Unloading operation YES / NO	Stops	C F-29
Moves to transport lock position YES / NO	Stops	C F-27
Moves to standby position YES / NO	Stops	C F-27
Complete = Normal		



Cancellation

- Turn power button OFF/ON.

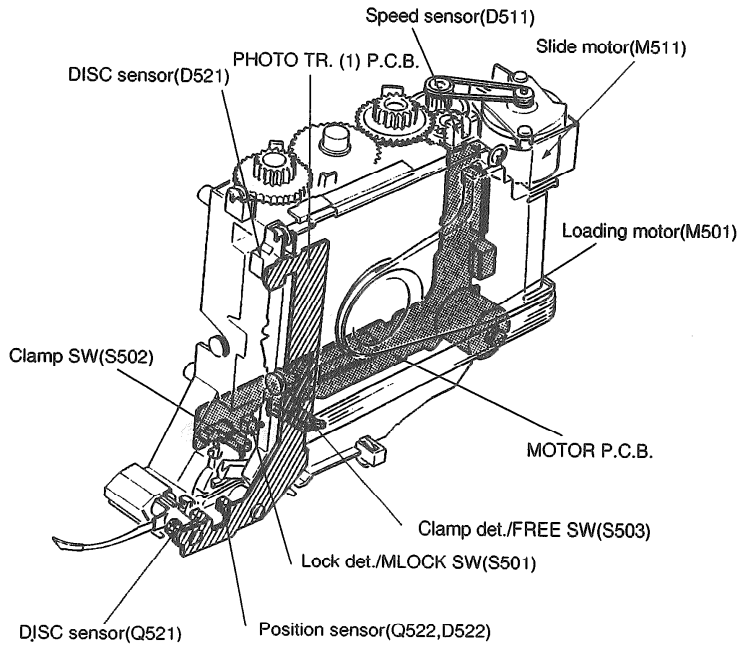
Self-diagnosis Mechanical mode

Display and handling

Display	Cause	Handling
F-15	The sympton is slow start-up of the CD when power is turned ON. The cause is defective contact of the OPU rest switch.	Abnormal rest detection switch (S701).
F-26 (Automatic display)	Sympton is that the unit does not operate when the play button is pressed, or the CD is skipping etc. The probable cause is defective system control IC. Lock det./MLOCK SW (S501) does not go ON/OFF in initial operation.	* Check system control (IC401) and servo IC (IC702). * Check each IC and the servo circuit. * Check Lock det./MLOCK SW (S501).
F-27	Sensor abnormal. Load on slide drive system is too great. Loading unit does not move to the right and left. Slide motor malfunction.	* Check slide motor (M511). * Check position sensor (Q522, D522) and speed sensor (D511). * Check gears of slide drive system. (Jammed by foreign matter or great teeth missing.)
F-28	Clamp det./FREE SW does not go OFF, and Clamp det.SW (S502) does not go ON within 5 seconds during loading.	* Check Clamp det./FREE SW (S503) and Clamp SW (S502). * Check loading motor (M501). * Check loading drive system. (Riding-up, shifting or foreign matter jamming of levers, missing gear teeth etc.)
F-29	Clamp det./FREE SW (S503) and clamp SW do not go ON within 5 seconds during unloading.	

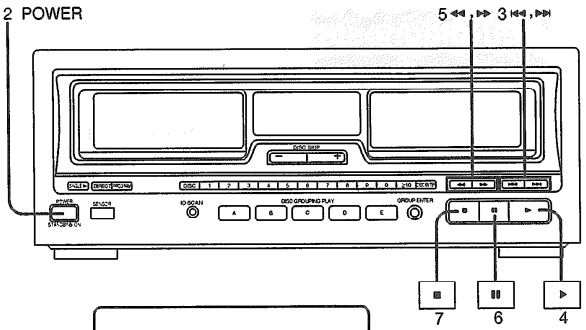
<Method for returning from error display to normal display>

* C F-26: When repair is complete, the error display disappears automatically.
* C F-15/ 27/ 28/ 29: Power SW ON/ OFF.



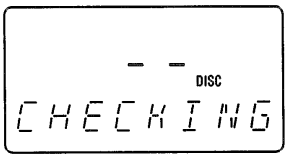
Ref. No.	Part name (Part number)
IC401	System control IC (UPD78044A172)
IC702	Servo processor IC (MN662741RPA)
S501	Lock det./MLOCK SW (RSP1A017-A)
S502	Clamp det. SW (RSH1A005)
S503	Clamp det./FREE SW (RSH1A005)
S701	Rest detection SW (RSM0006-P)
Q521	Disc sensor (PT4810F)
Q522	Position sensor (PT480F)
D511	Speed sensor (RSQGP1S53V)
D521	Disc sensor (LN66S)
D522	Position sensor (GL480V)
M501	Loading motor (RFKPLMC50PAK)
M511	Slide motor (RFKPLMC50PBK)

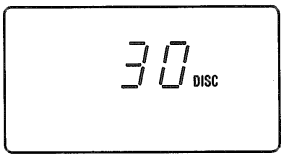
Check of basic CD operation



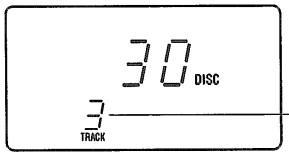
1 [With power supply OFF]
Place one disc in stocker. For example, place a disc in slot No.30.

2 POWER
Press power
[CHECKING DISCS] scrolls across the display, and the number of the slot containing the disc is displayed.



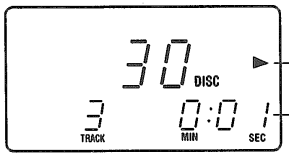


3 ⏮ ⏭
Press either (⏮ or ⏭) until you reach the desired track.
⏮ : You can skip backward.
⏭ : You can skip forward.



Track number at the playing position.

4 ►
Press PLAY (►).

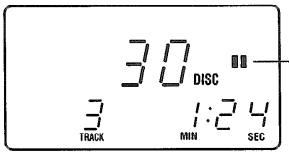


Play indicator

Elapsed play time

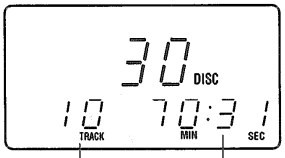
5 ◄◄ ►►
[In the play or pause mode]
Press and hold ◄◄ or ►►
◄◄ : you can search backward.
►► : You can search forward.

6 ⏸
Press PAUSE (⏸).



Illuminates

7 ■
Press STOP (■).



Total number of tracks

Total playing time

Result	Handling
No abnormalities in any operation	In accordance with the buttons operated in Self-diagnosis: FL display mode, all operation buttons (32 buttons) except the DISC ENTER button are normal. Perform PROGRAM and other operation.
Fails to play or play performance is poor.	Perform servo adjustment mode (p26, 27).
Failure of operation other than play. (Example) Does not skip tracks.	Check between button which does not work and servo module. Check for FFC catching of the OPU. Check for bending of the traverse deck worm gear.

Self-diagnosis Test mode A

Setting

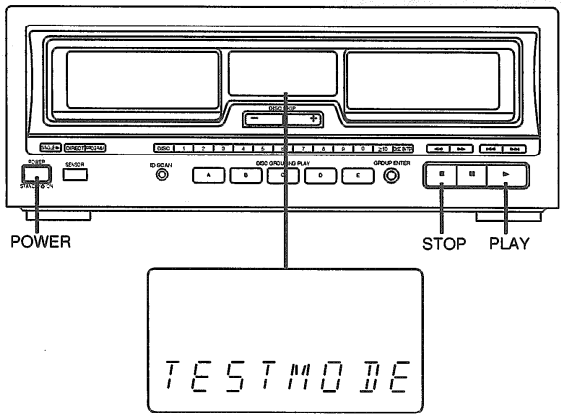
Turn OFF power button with no disc loaded.

↓

Turn ON power button while simultaneously pressing PLAY(►) button and STOP (■) button.

↓

"TEST MODE" appears on the display.

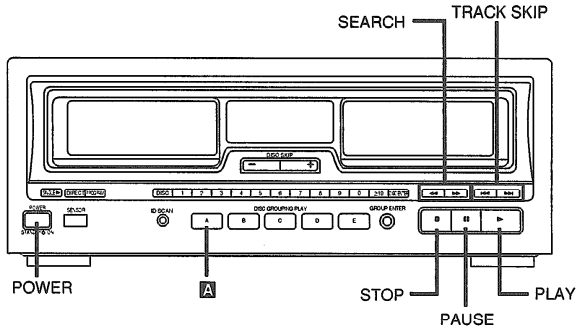


To independently operate the traverse deck,

Press the A button on the operation panel.

↓

The following buttons now work: PLAY (►), PAUSE (▮▮), STOP (■), SEARCH (◄◄ , ►►) and TRACK SKIP (I◄◄ , ►►I).



Cancellation

Turn the power button OFF/ON

In case of a panel block malfunction

With this equipment, the traverse deck can be operated independently even if the panel block malfunctions.

Connect TEST POINT 1 and the 5V line with lead wire.

↓

Plug into the outlet.

↓

Setting complete

Connect TEST POINT 2 and the 5V line with lead wire.

↓

PLAY operation starts.

↓

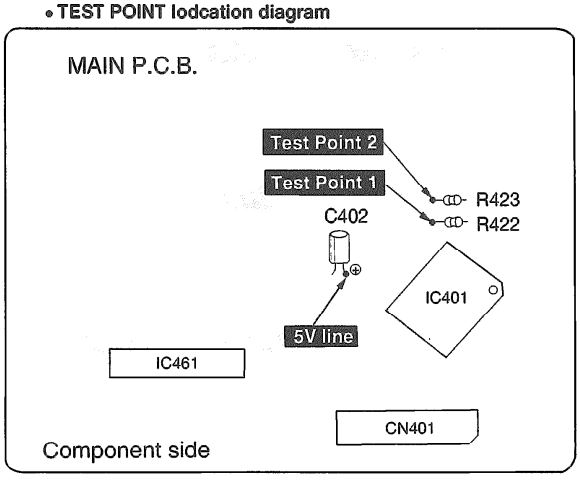
Remove the lead wire from TEST POINT 2 and the 5V line.

↓

STOP state.

* To cancel, remove all lead wires.

• **TEST POINT location diagram**



Self-diagnosis Test mode B

To perform load and unload operations at the loading unit,

"TEST MODE" appears in the display.

Press the button B on the operation panel.

Has the loading unit been removed from the frame?

The slide motor spins for approx. 5 seconds.

Moves to transport lock position.

Moves to standby position.

Moves to slot No.15.

Loading operation

Stops for 1 second

Unloading operation

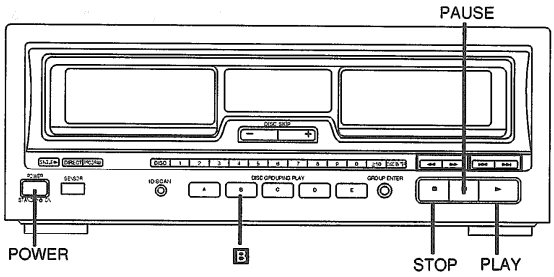
Stops for 1 second

This operation repeats until cancellation.

Setting the "TEST MODE"

Turn OFF power button with no disc loaded.

Turn ON power button while simultaneously pressing PLAY (►) button and STOP (■) button.



Cancellation

Turn the power button OFF/ON

In case of a panel block malfunction

With this equipment, the traverse can be operated independently even if the panel block malfunctions.

Connect TEST POINT 2 and the 5V line with lead wire.

Plug into the outlet.

Setting complete

Connect TEST POINT 1 and the 5V line with a lead wire.

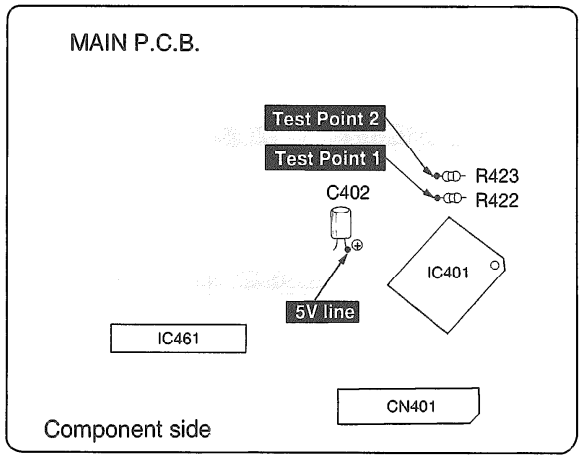
Perform the above operation.

Remove the lead wire from TEST POINT 1 and the 5V line.

STOP state.

* To cancel, remove all lead wires.

• TEST POINT lodcation diagram



Self-diagnosis Test mode C

To perform linked operation of the loading unit,

Setting the "TEST MODE"

Turn OFF power button with no disc loaded.

↓

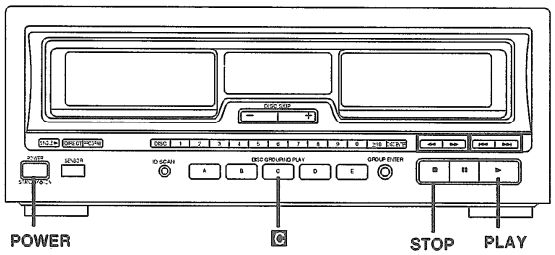
Turn ON power button while simultaneously pressing PLAY (►) button and STOP (■) button.

→ "TEST MODE" appears in the display.

Load disc at single (slot No.0) position.

↓

Press button C on the operation panel.



The follwing automatic operation begins.

↓

Starts the play the disc at slot No. 0 for a second, then stops the play.

↓

Moves one to the right (slot No.1).

↓

Unloads the disc to slot No.1.

↓

Loads the disc and plays for a second and stops.

↓

Moves one to the right (slot No.2)

↓

The same operation as above until slot No.110.

↓

Moves one to the left (slot No.109).

↓

The same operation as above until slot No.0.

Continue

Cancellation

* Turn power button OFF/ON.

Self-diagnosis Servo adjustment mode

This function shows the operating status of the servo system circuits (focus, tracking, CLV) on the FL display.
The results of automatic adjustment of the servo circuit are also displayed, using error codes.

Check when assembled

Load CD into stocker.

Turn OFF the power button.

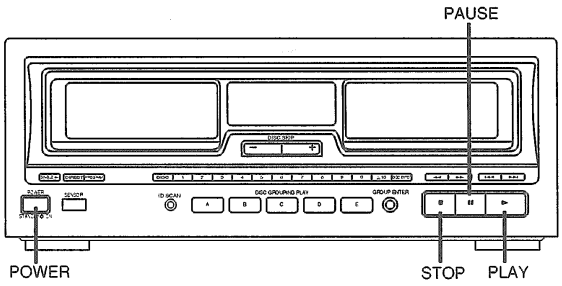
Turn ON the power button while simultaneously pressing STOP (■), PAUSE (▮▮) and PLAY (►).

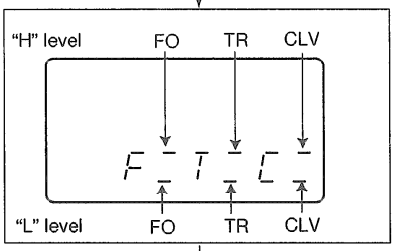
Check while disassembled

Set to S/M p.33 state.

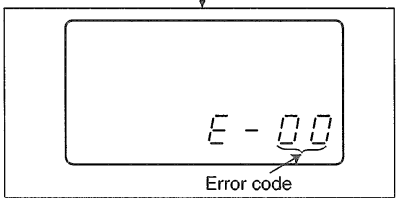
Perform " **To independently operate the traverse deck** " on p.23.

Press PLAY (►), and after playing for 10 seconds, press PAUSE (▮▮).



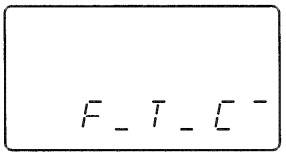


Press STOP (■).



Result	Handling
E-00	Normal
Other display, (Example) E-01	Refer to p.27 to remedy.

How to read FTC.



= Normal

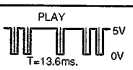
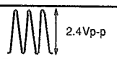
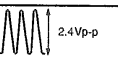
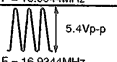
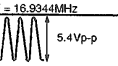
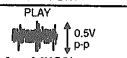
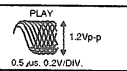
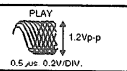
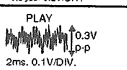
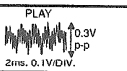
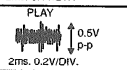
	"H" level	"L" level
F	FO system NG	FO system OK
T	TR system NG	TR system OK
C	CLV system OK	SP mortor NG

FO: Focus
TR: Tracking
CLV: CLV servo

● **Error code based on troubleshooting**

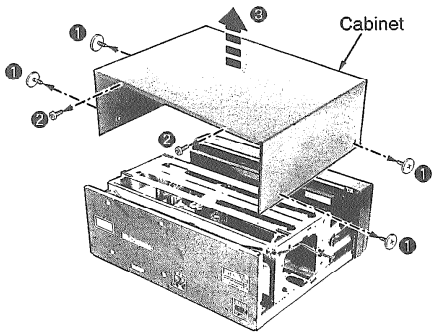
※ The unit is satisfactory if the error code is **E - 00** of **E - 02**

※ Before testing, check that the test disc is free of scratches and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E - 01	Focus and tracking offset adjustments not completed in the specified time period.	1. Clocks X1 and X2, power supply VDD and reset/RST, all on IC702. 2. MDATA, MCLK, MLD and SENSE signal to/from mechanism controller.	MDATA	IC702 ⑧ pin		4.9V
			MCLK	IC702 ⑦ pin		4.8V
			MLD	IC702 ⑨ pin		4.9V
			SENSE	IC702 ⑩ pin	0V	0V
			/RST	IC702 ⑱ pin	4.9V	4.9V
			X1	IC702 ⑱ pin		
			X2	IC702 ⑲ pin		
E - 03 E - 05 E - 07 E - 09 E - 0B E - 0D E - 0F	Disc play unstable.	1. Scratches or contaminants on disc surface. 2. Focus and tracking servo circuits (check waveforms, voltages, and part values.) 3. Spindle driver circuit. 4. Optical pickup.	FE	IC702 ㉜ pin		2.5V
			TE	IC702 ㉝ pin		2.5V
			FOD	IC702 ㉘ pin	2.5V	2.5V
			TRD	IC702 ㉗ pin	2.5V	2.5V
			KICK	IC702 ㉖ pin	2.5V	2.5V
			/FLOCK	IC702 ⑪ pin	0V	4.9V
			/RF DET	IC702 ㊳ pin	0V	4.9V
			RF	TJ701		2.4V
			STAT	IC702 ⑰ pin	1.3V	0V
E - 04 E - 06 E - 0C E - 0E	Best "Eye" (PD Balance) adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FBAL	IC702 ㉚ pin	2.5 ±1.25V	2.5 ±1.25V
			RF	TJ701		2.4V
			FE	IC702 ㉜ pin		2.5V
			/TLOCK	IC702 ⑫ pin	0.1V	0V
			OFT	IC702 ㊱ pin	0V	0V
E - 08 E - 0A	Focus or Tracking gain adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FE	IC702 ㉜ pin		2.5V
			TE	IC702 ㉝ pin		2.5V
			/TLOCK	IC702 ⑫ pin	0.1V	0V
			OFT	IC702 ㊱ pin	0V	0V

Disassembly/Operation Checks/Reassembly Procedures

■ COMMON • • • • • ITEMS FOR EACH PROCEDURE



❶, ❷ Remove the 6 screws.

❸ Remove the cabinet.

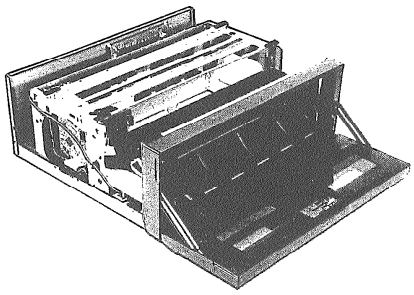
❶ (Black) ϕ 3 × 10mm

❷ (Black) ϕ 3 × 8mm

※ The numbers reversed in white indicate the order of procedures.
※ The screw illustrations are equivalent to actual size.

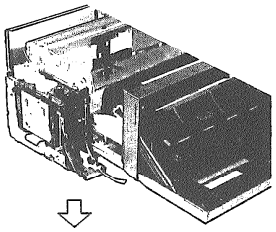
■ PRIOR TO THE OPERATION CHECKS

The following DISASSEMBLY/OPERATION CHECKS/REASSEMBLY procedures consist of 3 main items.
Follow the appropriate procedures to the failed block.

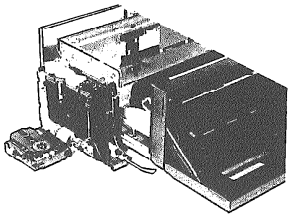


• Each block are described in order to the followings. DISASSEMBLY ➡ OPERATION CHECK ➡ REASSEMBLY

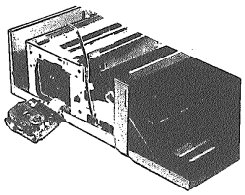
Act.1 ⇨ Loading unit (☞Refer to pages 30~37)



Traverse deck separation (☞Refer to pages 38~41)



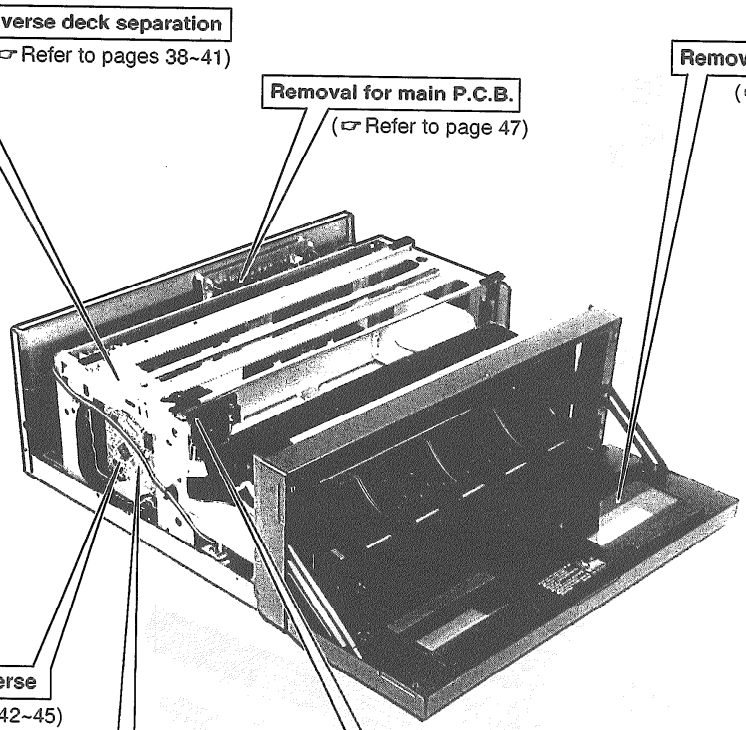
Act.2 ⇨ Traverse deck (☞Refer to pages 42~45)



Act.3 ⇨ Front panel (☞Refer to page 46)

Main P.C.B. (☞Refer to page 47)

Repair Guide



Removal for loading unit
(☞Refer to pages 30~37)
⬇
Traverse deck separation
(☞Refer to pages 38~41)

Removal for main P.C.B.
(☞Refer to page 47)

Removal for front panel
(☞Refer to page 46)

Removal for traverse
(☞Refer to pages 42~45)

Servo module diagnosis
- Mechanical mode setting (☞Refer to pages 20~22)
- Servo adjustment mode (☞Refer to pages 26,27)

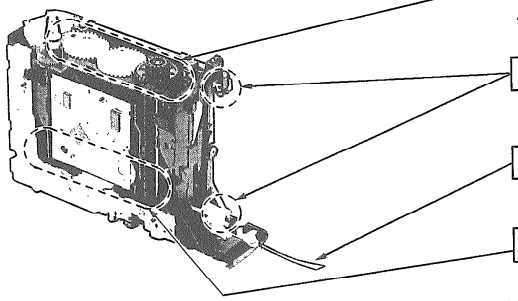
Operation checks for loading
- Mechanical mode setting (☞Refer to pages 20~22)
- Servo adjustment mode (☞Refer to pages 26,27)

Precaution
- Handling of the loading unit (☞Refer to pages 30)

Precaution

■ Handling of the loading unit

• During the loading unit disassembly/operation checks/reassembly, handle the following parts carefully .



Each travel gear
• Check each gear for rotating in assembly.

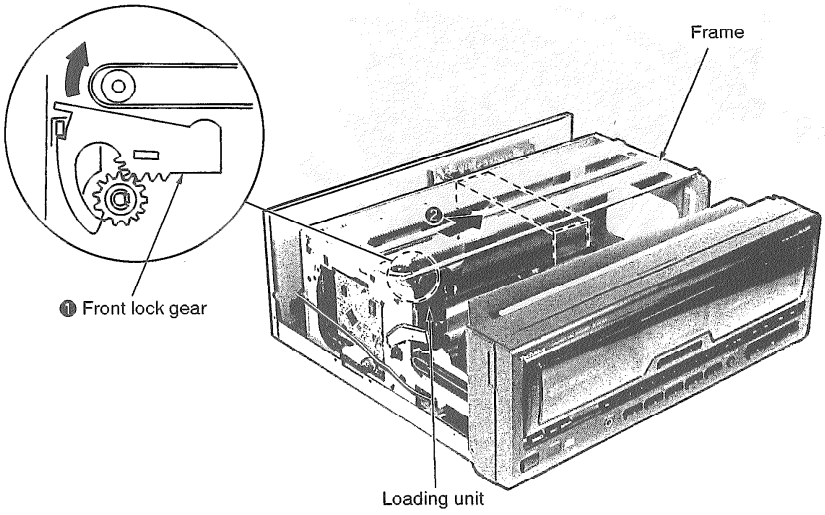
LED and Photo coupler
• Dust, incorrect position and etc.

Front feed lever
• Broken, deformation and etc.

Each loading gear
• Check each gear for rotating in assembly.

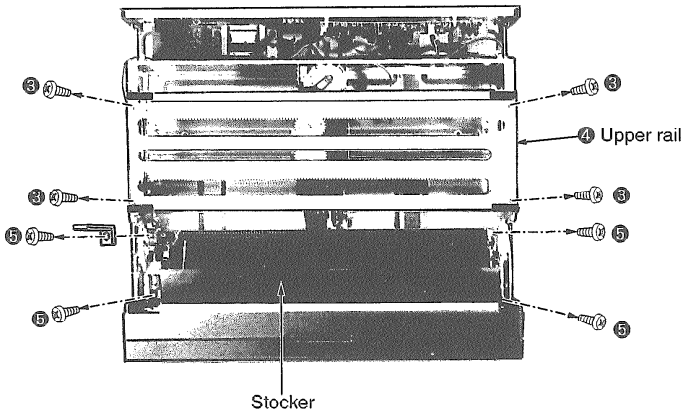
Act.1 Loading unit Disassembly

■ Handling of the loading unit



❶ Unlock the loading unit by moving the front lock gear manually in the direction of arrow.

❷ Move the loading unit manually in the right direction.
(Move the loading unit to the right direction beyond the center of the frame.)



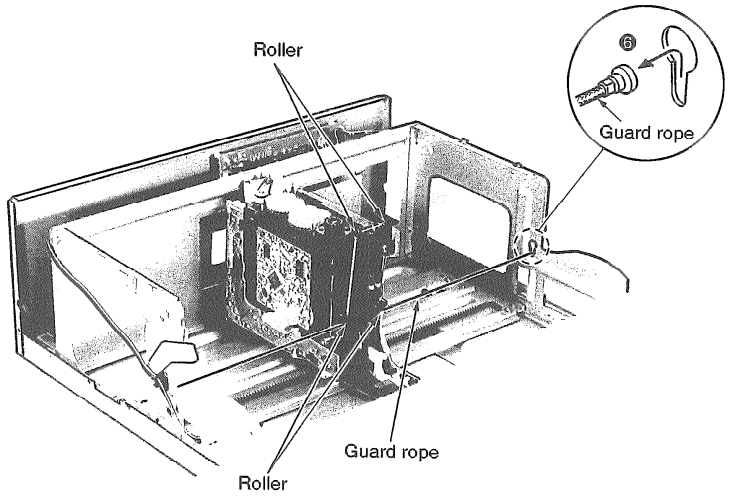
❸ Remove the 4 screws for upper rail.

❹ Remove the upper rail.

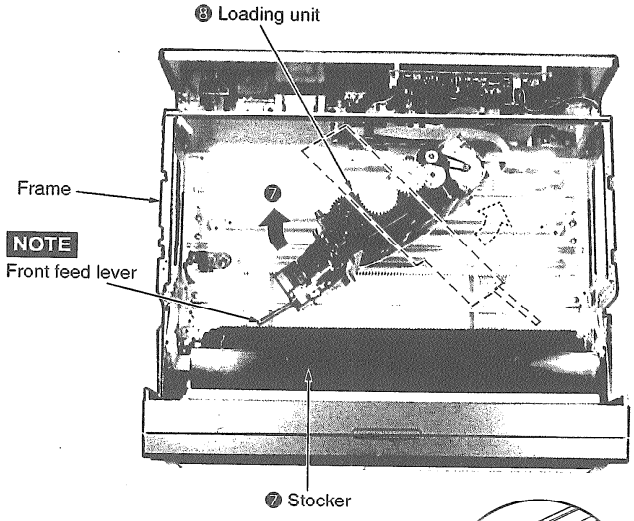
❺ Remove the 4 screws for stocker.

❸,❺ ϕ 3 × 6mm

Act.1 Loading unit Disassembly



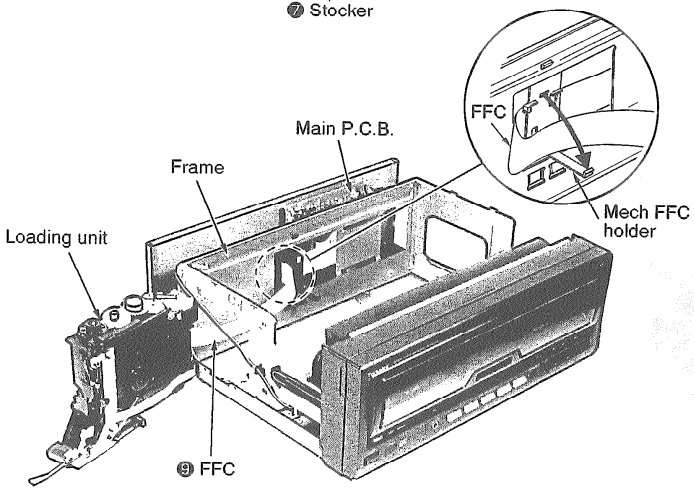
⑥ Remove the guard rope.



NOTE

When removing the loading unit, make sure to avoid the front feed lever from the stocker and then, lift up the loading unit because the front feed lever is positioned under stocker.

⑦ Rotate the loading unit to clockwise or counterclockwise with lifting the stocker and then,slide the front feed lever under the stocker.
⑧ Remove the loading unit from frame.



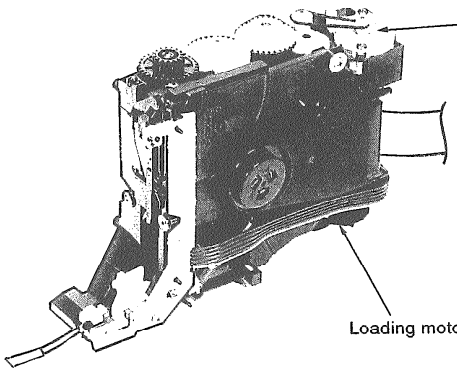
⑨ Remove the mech FFC holder.

⑩ Remove the FFC from loading unit. Then, reconnect the FFC to the loading unit through the opening of frame.

Preparation for operation checks is completed.

Act.1 Loading unit Operation checks

■ Test mode



❶ Set to the test mode and then, push the button [B] on front panel (☞Refer to page 24)
❷ The slide(right or left direction) motor rotates for approximate 20 seconds.
❸ Then, the loading motor rotates with repeating the following operation.

Load ➡ (Stop for 1 second) ➡ Unload ➡ (Stop for 1 second)

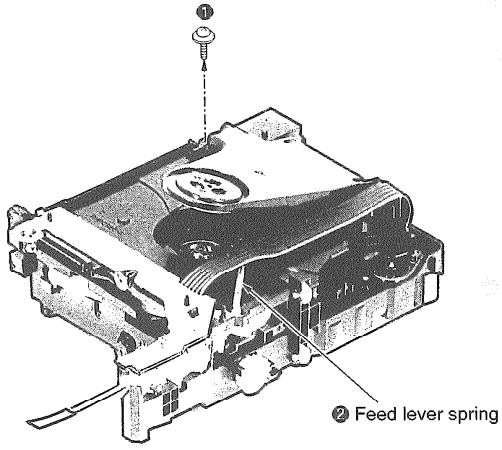
Make sure there are no unusual noise, binding or running over visually.

❹ To relieve the operation, set to the power off.

※ This operation can be executed without traverse deck (including servo module).

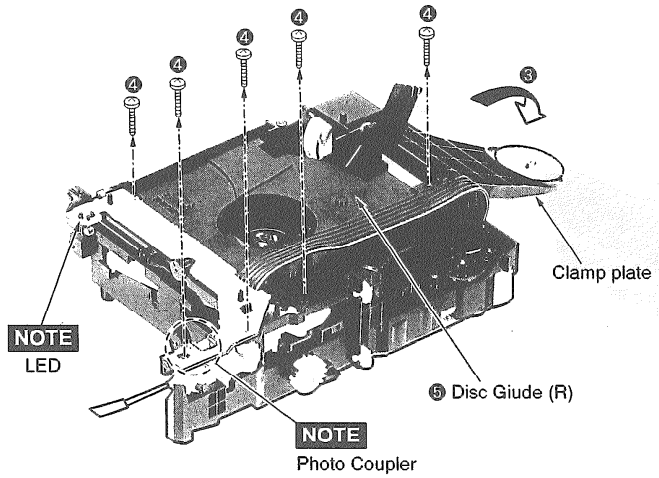
■ Manual operation

(For this operation, remove the parts described in "Test mode", and more the parts as follows.)



❶ Remove the 1 screw.

❷ Remove the feed lever spring.

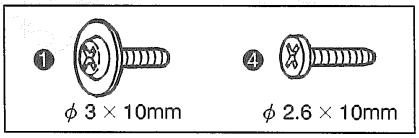


❸ Tilt the clamp plate backward.

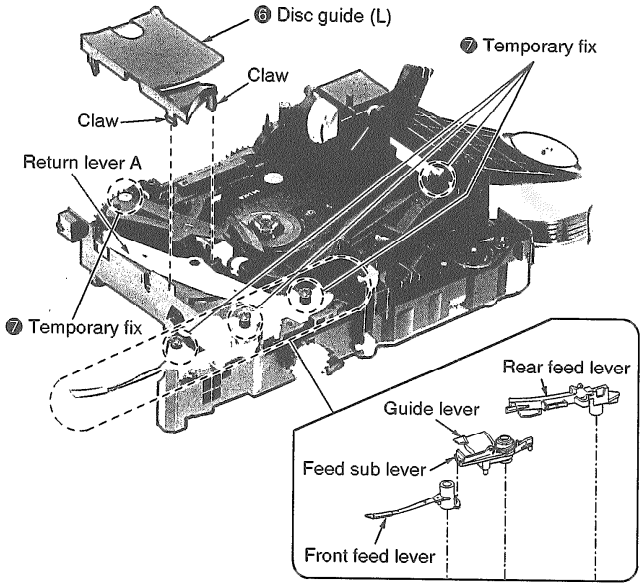
❹ Remove the 5 screws.

❺ Remove the disc guide (R).

NOTE
Take care not to touch the LED or photo coupler by hand.

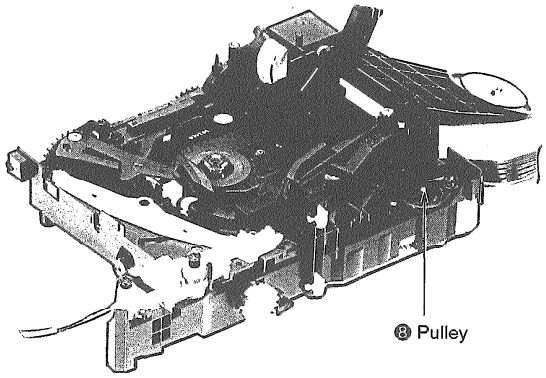


Act.1 Loading unit Operation checks



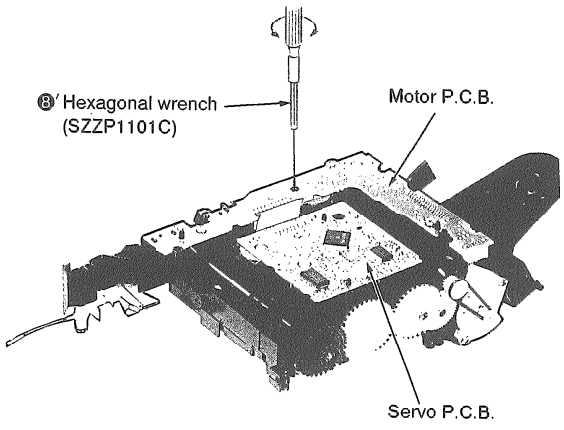
⑥ Release the 2 claws and then, remove the disc guide (L).

⑦ In this manual operation, the rear/front feed levers, guide lever ass'y, etc. may be removed because the disc guides(L/R) are removed already.
Tempoarary fix those levers with 5 screws.



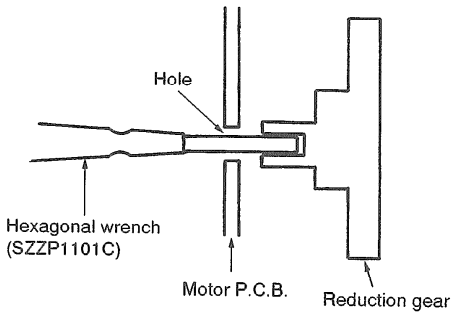
⑧ In case of confirmation manually, rotate the pulley as shown left.

- Rotate clockwise : Loading operation
- Rotate counterclockwise : Unloading operation



⑧′ Or rotate with 2 mm hexagonal wrench (SZZP1101C).

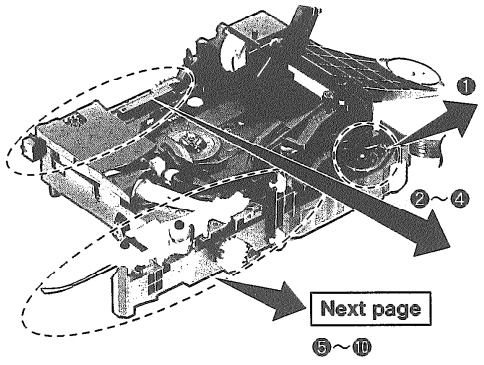
- Rotate clockwise : Unloading operation
- Rotate counterclockwise : Loading operation



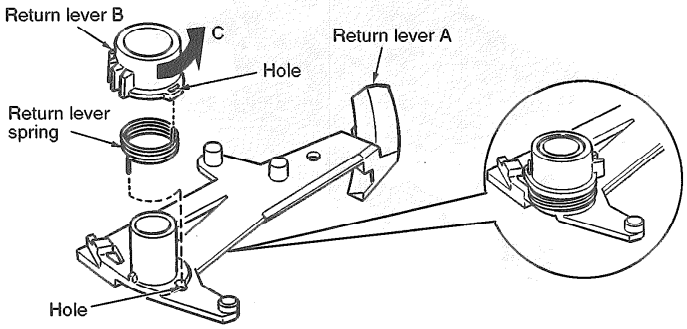
Act.1 Loading unit Reassembly

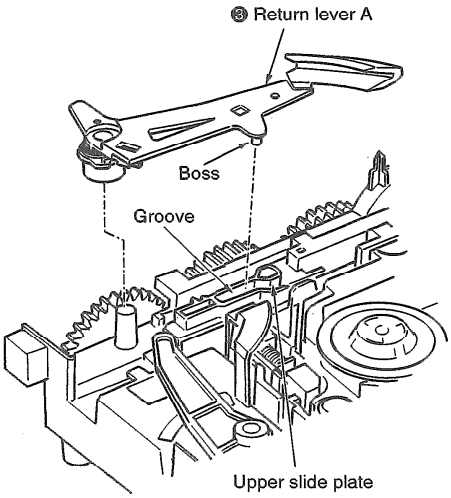
■ **In Test mode** ····· Follow the items ⑯ ~ ㉒.

■ **In Manual operation** ····· In case that the parts fixed temporary are removed, the perform the items ❶ ~ ⑩ and then, follow the items ⑪ ~ ㉒.



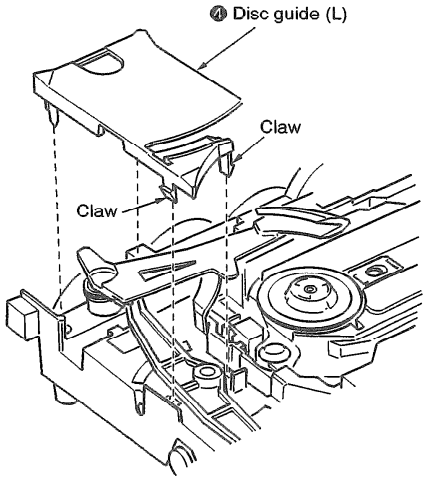
❶ Rotate the pulley clockwise fully.





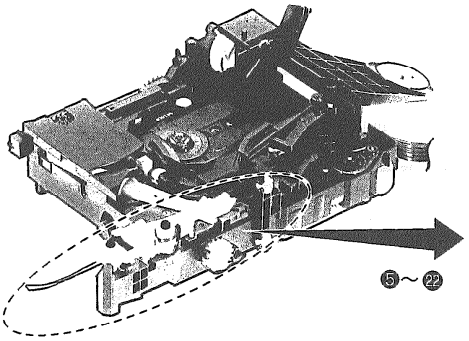
❷ Align the both ends of the spring with the holes of return lever A and B and then, install the return lelver A with rotating the return lever B in the direction of arrow (➡) C.

❸ Install the return lever A.
(Align the boss of return lever A with the groove of upper slide plate.)

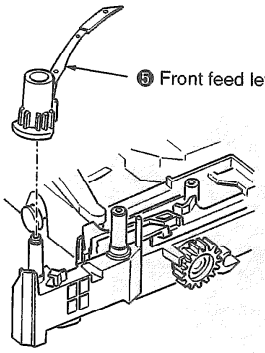


❹ Install the disc guide(L).
(Press the disc guide (L) untill the claws are hooked completely.)

Act.1 Loading unit Reassembly

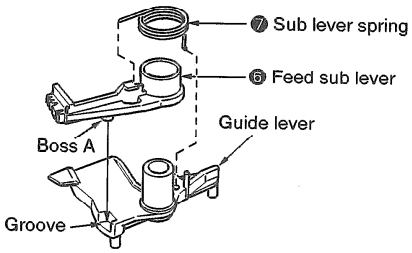


(The state of pulley rotated clockwise fully.)



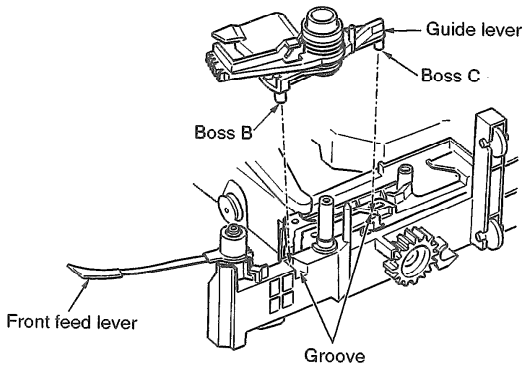
⑤ Install the front feed lever.

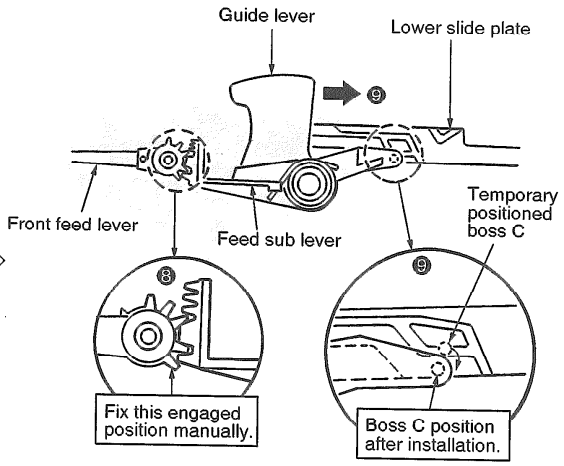
NOTE
Avoid the front feed lever to deform or bend.



⑥ Install the feed sub laver to the guide lever.
- Align the boss A of feed sub lever with the groove of the guide lever.

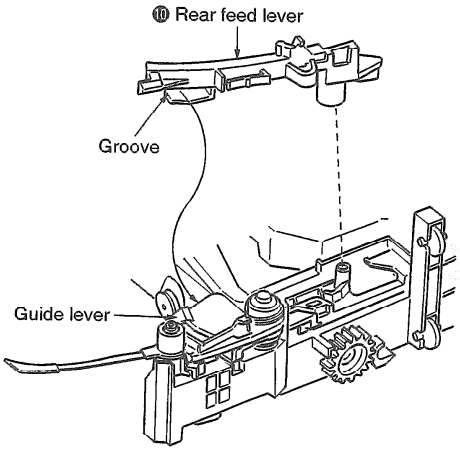
⑦ Install the sub lever spring.





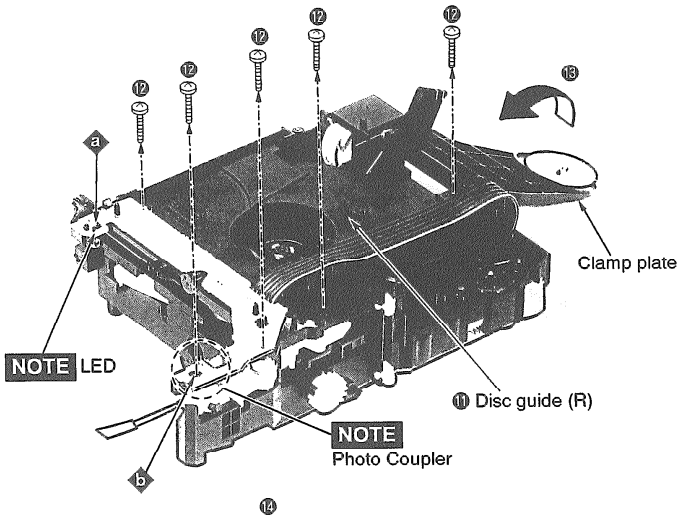
⑧ Engage the gear of guide lever ass'y with the gear of front feed lever temporary.
- Boss B must be placed in the groove.
- Boss C must be run over the lower side plate.

⑨ With fixing the gear by finger not to slip off the gear clench, rotate the guide lever in the direction of arrow.
- The boss C will fit in the groove.



⑩ Install the rear feed lever.
(Align the guide lever with the groove of rear feed lever.)

Act.1 Loading unit Reassembly



⑪ Install the disc guide(R).

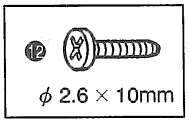
NOTE

Align the claw of disc guide with the slot ◆a◆ .

⑫ Install the 5 screws.

NOTE

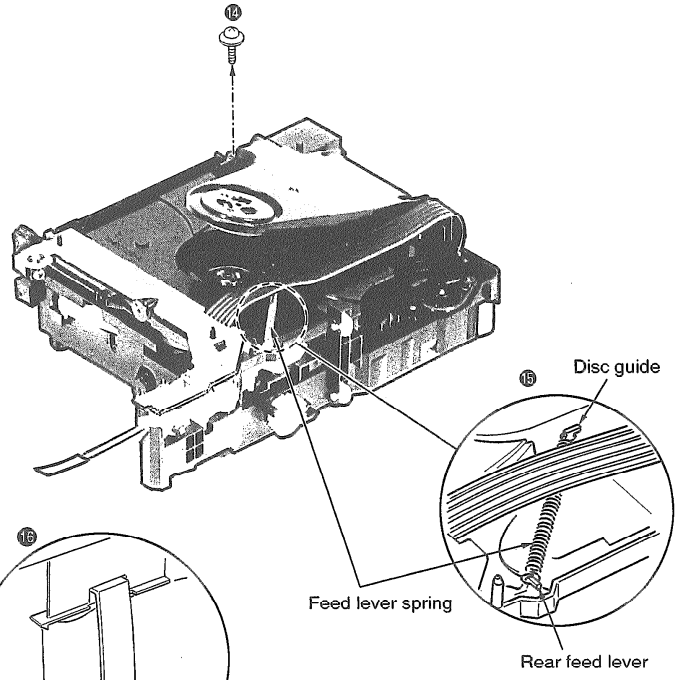
Align the upper portion of boss inserted sensor holder with the slot ◆b◆, and then tighten screw.



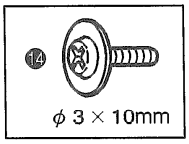
⑬ Tilt the clamp plate forward.

NOTE

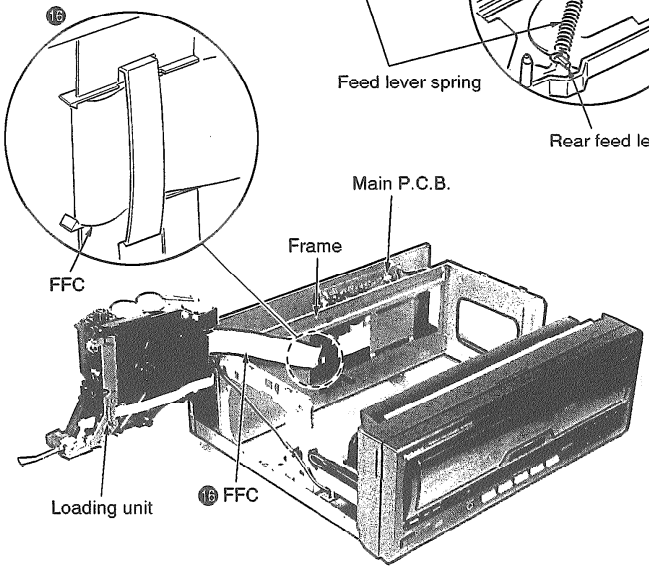
Take care not to touch the LED or photo coupler by hand.



⑭ Install the 1 screw.

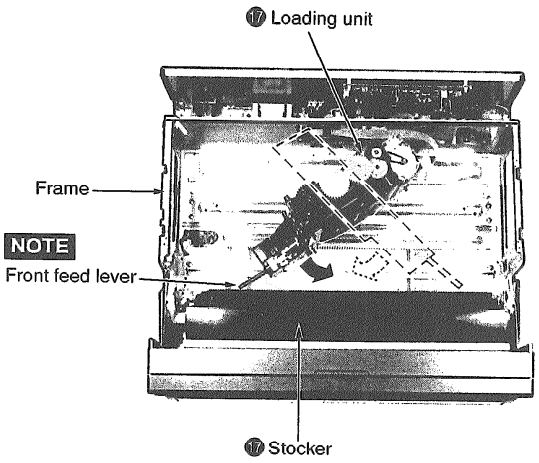


⑮ Install the feed lever spring.



⑯ Remove the FFC from loading unit. Then, reconnect the FFC to the loading unit over the frame.

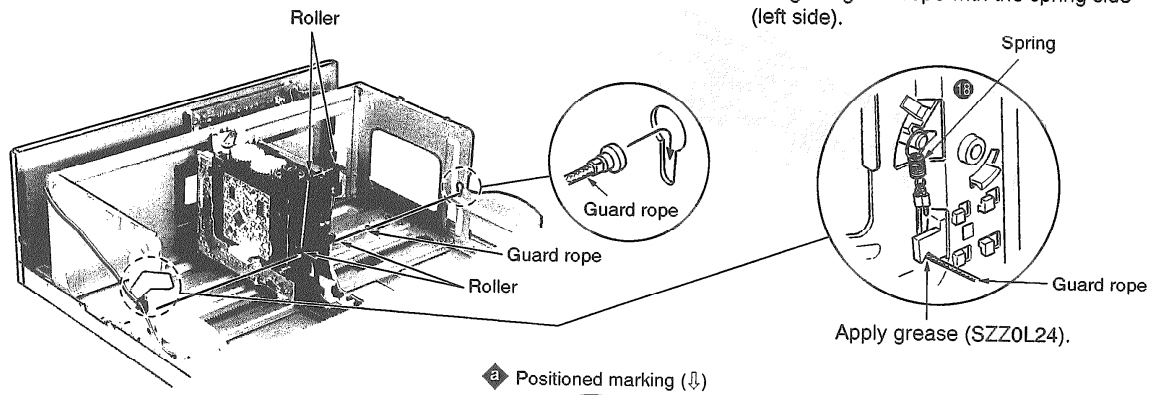
Act.1 Loading unit Reassembly



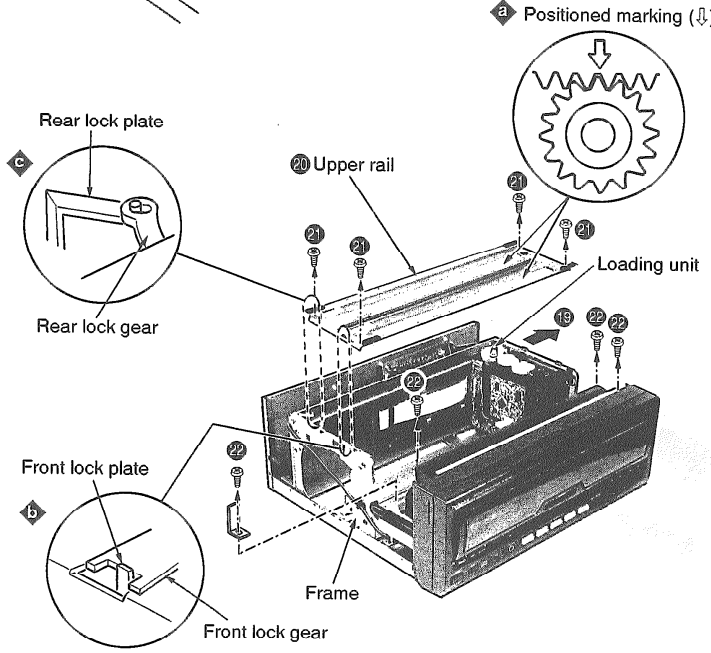
NOTE

When reassembling the loading unit, make sure to avoid the front feed lever from the stocker and then, install the loading unit because the front feed lever is positioned under stocker.

⑰ Rotate the loading unit counterclockwise or clockwise with lifting the stocker and then, place the front feed lever under the stocker.



⑱ Hang the guard rope with the spring side (left side).



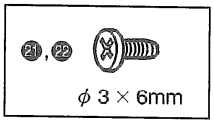
⑲ Move the loading unit to the right end of frame.

⑳ Install the upper rail to the frame.
Then, make sure to perform the following operations.

- ⓐ Align the front travel gear and rear travel gear with the marked position of upper rail.
- ⓑ Engage the front lock gear with the front lock plate.
- ⓒ Engage the rear lock gear with the rear lock plate.

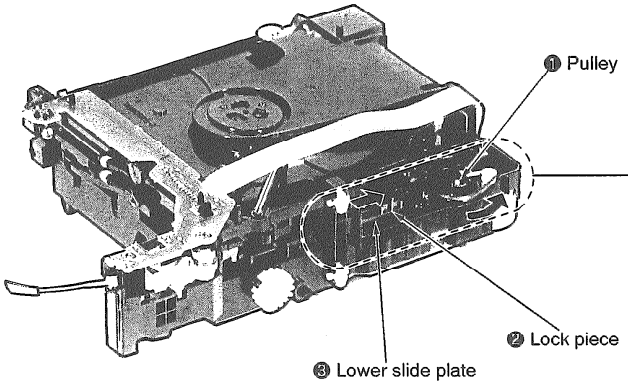
㉑ Install the 4 screws for upper rail.

㉒ Install the 4 screws for stocker.

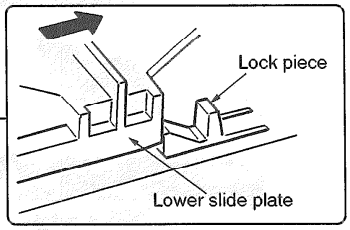


Act.1 Traverse deck separation Disassembly

The followings are described the procedures to make the traverse deck part from loading unit after removed the loading unit block from the frame.

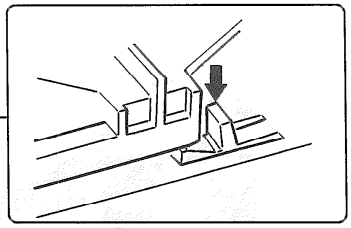


❶ Rotate the pulley counterclockwise.



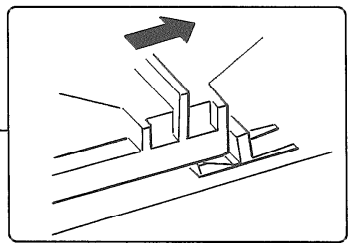
Rotate the pulley until the lower slide plate is moved in the direction of arrow and then touched to the lock piece.

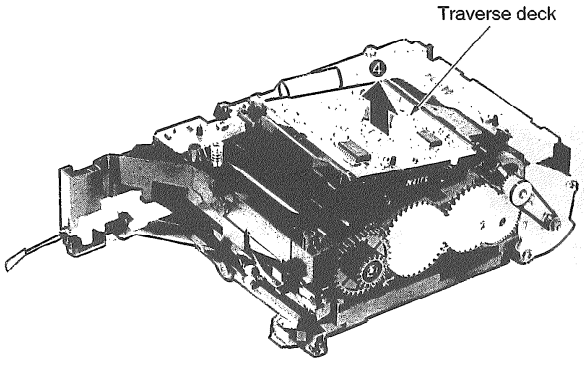
❷ Rotate the pulley counterclockwise fully with pressing the rib of lock piece.



The lower slide plate runs over the lock piece.

❸ Slide the lower slide plate manually in the direction of arrow until the lower slide plate touches the rib of lock piece

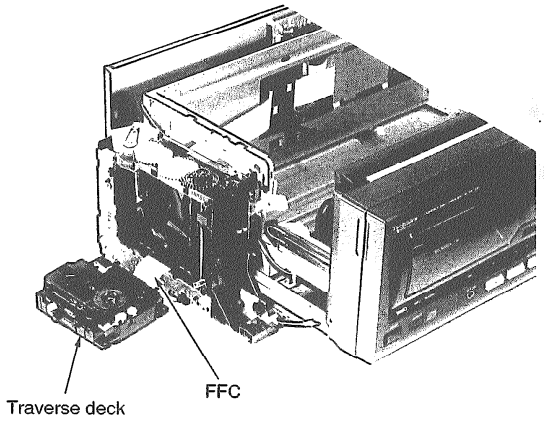




❹ Upset the loading unit and then, lift up the traverse deck.

Act.1 Traverse deck separation Operation check

■ Focus operation confirmation



❶ Set the switch to TEST MODE.
(☞Refer to page 23)

❷ Press the button A on the operation panel.

Standby the traverse deck to individual operation.

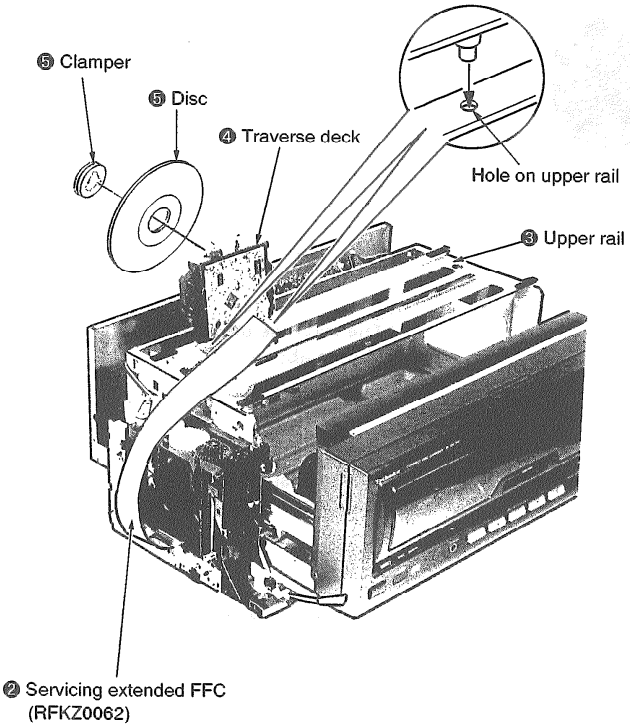
⇩

Press the PLAY(▶)button.

⇩

Confirm the focus operation visually.

■ Servo module confirmation



❶ Remove the FFC between the traverse deck and loading unit.

❷ Connect the servicing extended FFC between the traverse deck and loading unit.

❸ Install the upper rail.
(The screws are not necessary for fixing.)

❹ Locate the servo module faced to you and then, align the traverse deck with the hole on upper rail.

❺ Attach the disc to the clamper with magnet.

⇩

Preparation for operation checks is completed.

❻ Set the switch to TEST MODE.
(☞Refer to page 23)

❼ Press the button A on the operation panel.

⇩

Standby the traverse deck to individual operation.

⇩

Press the PLAY(▶)button.

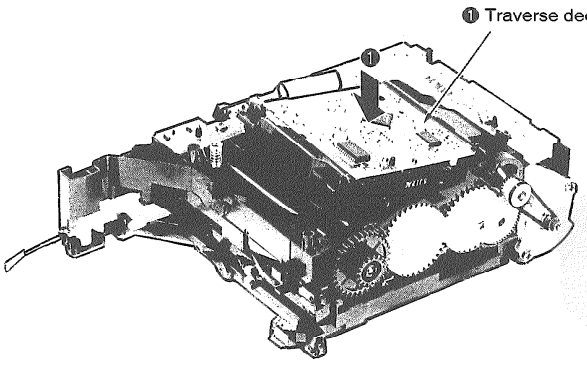
⇩

CD play starts.

⇩

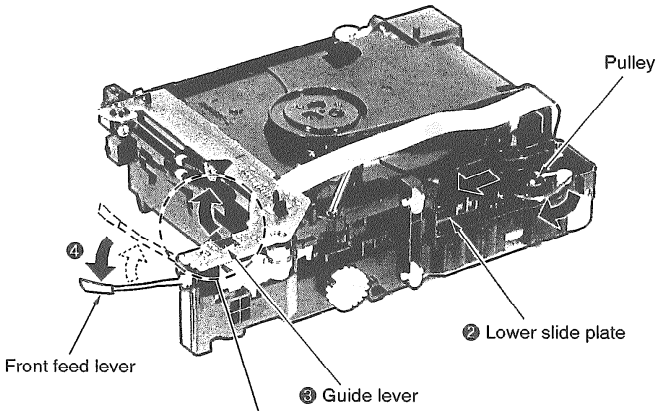
Check the servo module.

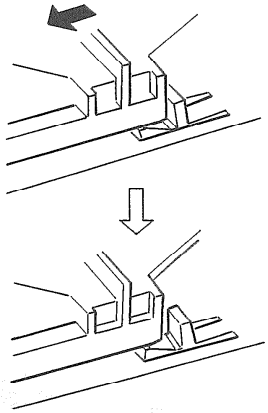
Act.1 Traverse deck separation Resassembly



❶ Equip the traverse deck with the loading unit.

❷ Slide the lower slide plate in the direction of arrow with supporting manually not to be fall free the traverse deck.

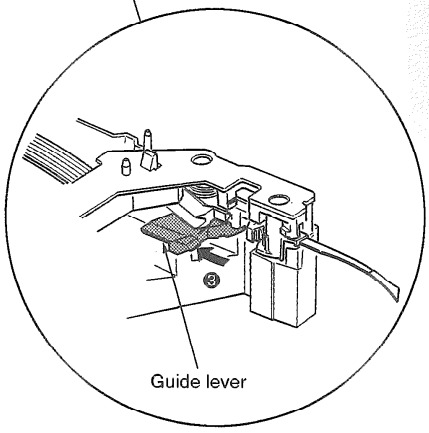




The traverse deck will not fall free as shown above.

❸ While pushing the guide lever in the direction of arrow, rotate the pulley clockwise.

To easy installation loading unit into the frame, raotate the pulley fully clockwise.



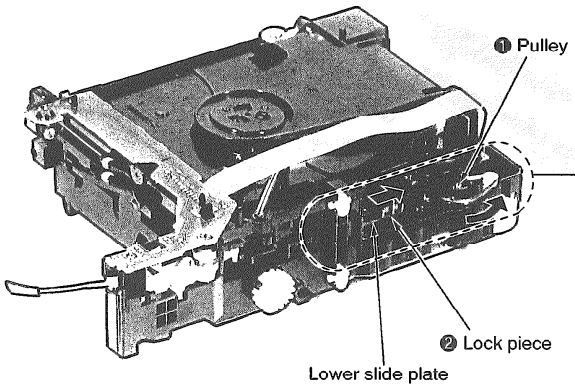
Confirmation

During the above operation , make sure that the front feed lever rotates to clockwise (Dot line) once and then, return to original position(Full line).

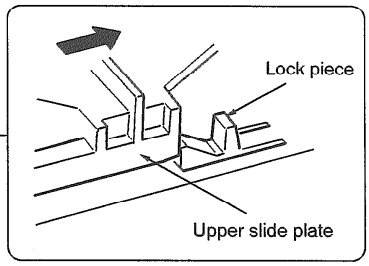
Act.1	Traverse deck separation	Reassembly

■ In case that the operations described in item "Confirmation" are not to be performed.

• In case that the operations described in item "confirmation" are not to be performed (The front feed lever will not return to original position (Full line) and is fixed at position indicated with dot line), perform the following operations.

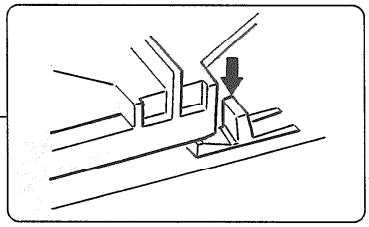


❶ Rotate the pulley counterclockwise.



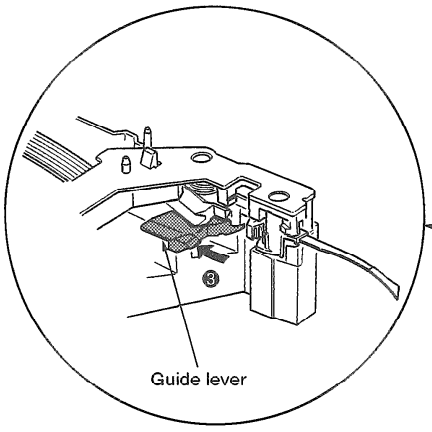
Rotate the pulley until the lower slide plate moves in the direction of arrow and touches the lock piece.

❷ With pushing the rib of lock piece, rotate the pulley counterclockwise fully.



The lower slide plate runs over the lock piece.

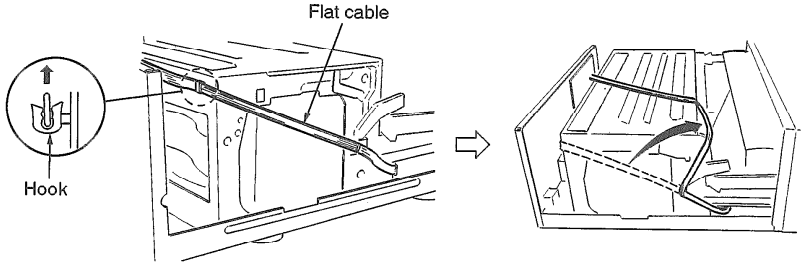
⇩



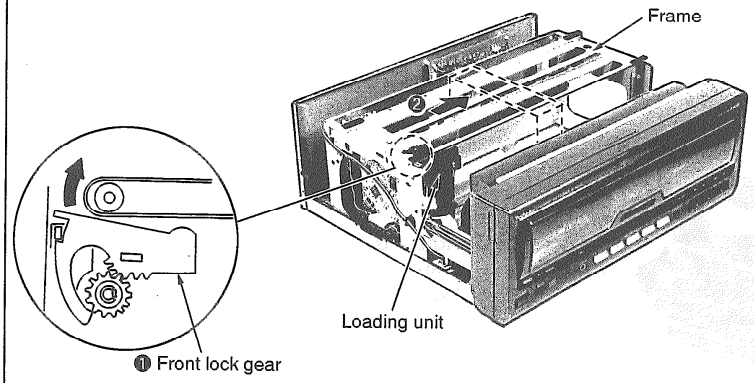
Rotate the pulley counterclockwise with pushing the guide lever as shown Item ❸ on page.

Act.2 Independent traverse deck Disassembly

- The traverse deck can be removed individually without removal of loading unit.
- It is very convenient to perform the operation checks for traverse deck quickly.

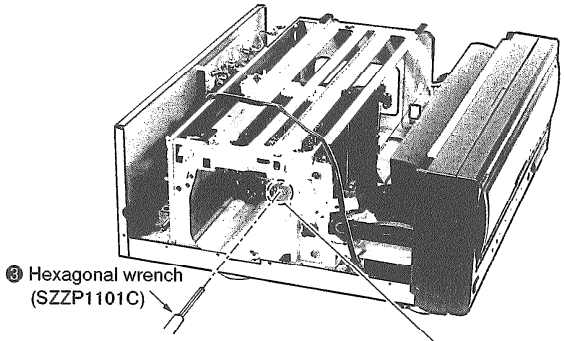


※ Release the flat cable from the hook and then, arrange it as shown right.

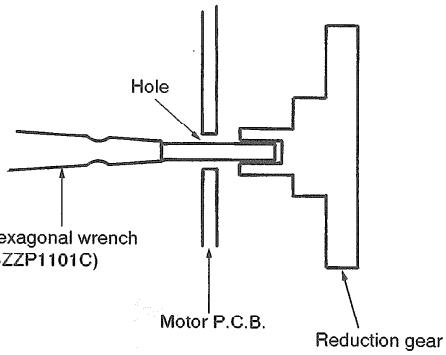


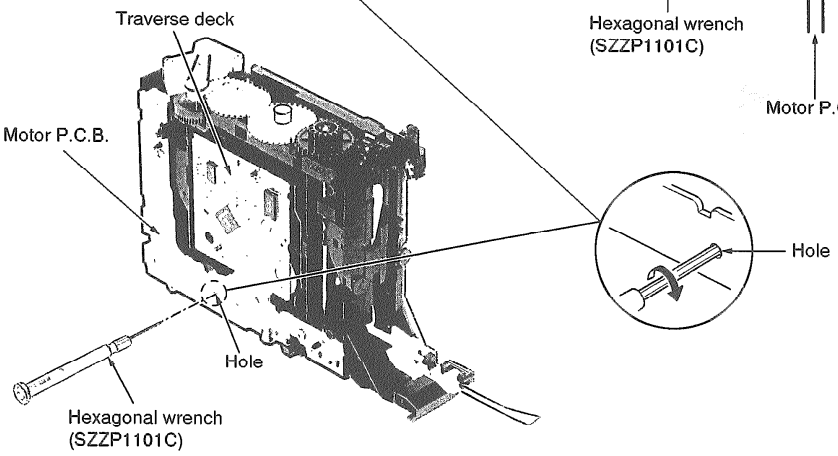
❶ Move the front lock gear manually in the direction of arrow and then, unlock the loading unit.

❷ Move the loading unit to the right end manually.
(Move the unit to the right direction beyond the center of the frame.)

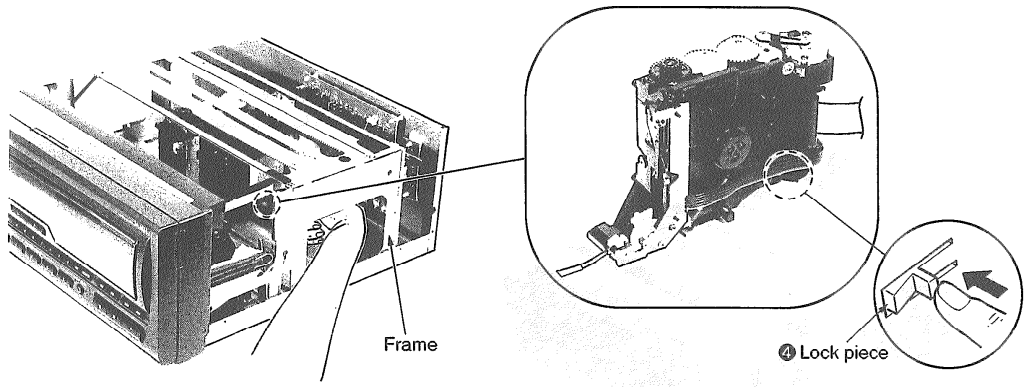


❸ Rotate the reduction gear B clockwise with 2mm type hexagonal wrench (SZZP1101C).



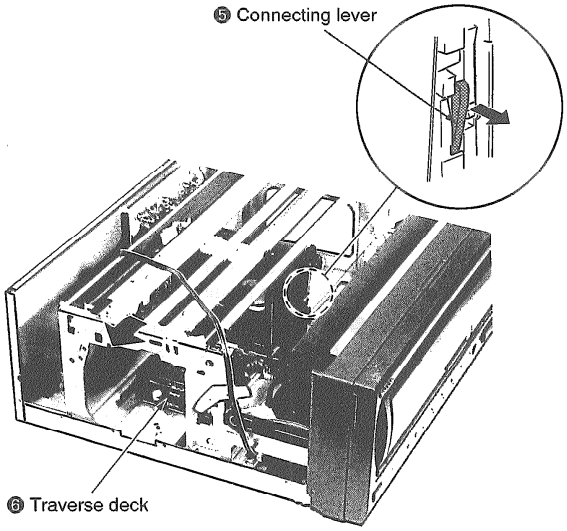


Act.2 | Independent traverse deck | Disassembly



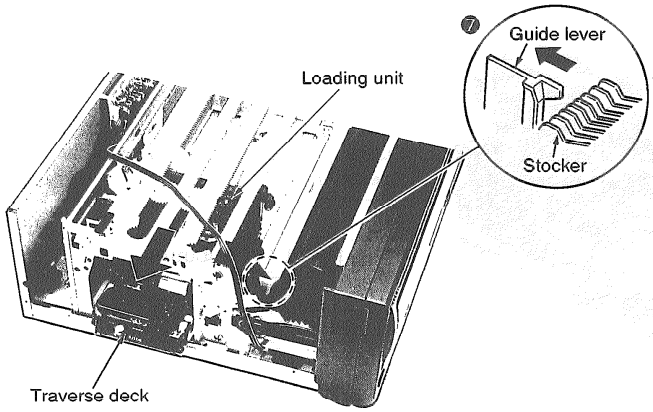
NOTE
Handle the edge of frame with care.

❹ Put the right hand into the right side of frame and then, pressing the lock piece, rotate the hexagonal wrench to clockwise.



❺ Pull the connecting lever in the direction of arrow.

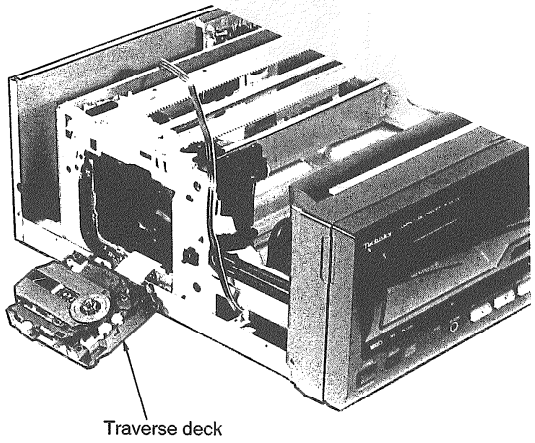
❻ Separate the traverse deck from the loading unit.



❼ Move the guide lever in the direction of arrow and then, move the loading unit to the left end with relieving the engagement to stocker.

Act.2 Independent traverse deck Operation checks

■ Focus operation confirmation



❶ Set the switch to TEST MODE.
(☞Refer to page 23)

❷ Press the button A on the operation panel.

⇩

Standby the traverse deck to individual operation.

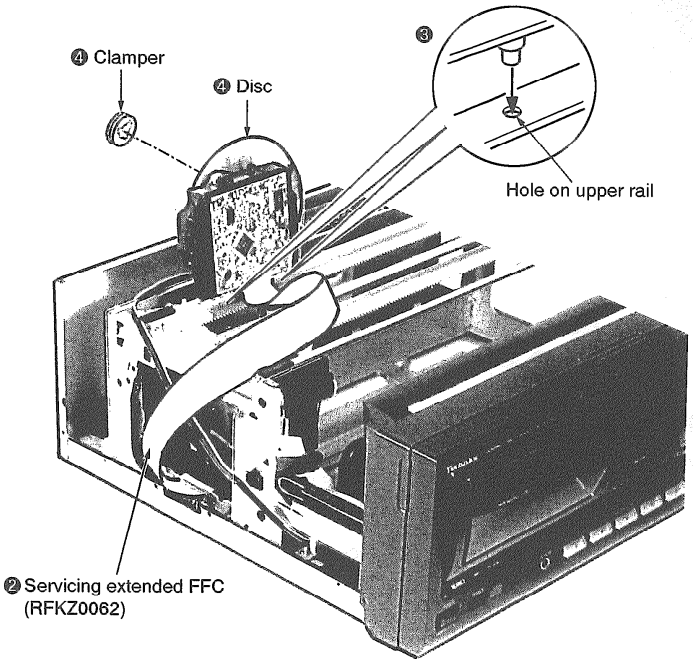
⇩

Press the PLAY(▶)button.

⇩

Confirm the focus operation visually.

■ Servo module confirmation



❶ Remove the FFC between the traverse deck and loading unit.

❷ Connect the servicing extended FFC between the traverse deck and loading unit.

❸ Locate the servo module faced to you and then, align the traverse deck with the hole on upper rail.

❹ Attach the disc to the turn table with clamper (magnet).

⇩

Preparation for operation checks is completed.

❺ Set the switch to TEST MODE.
(☞Refer to page 23)

❻ Press the button A on the operation panel.

⇩

Standby the traverse deck to individual operation.

⇩

Press the PLAY(▶)button.

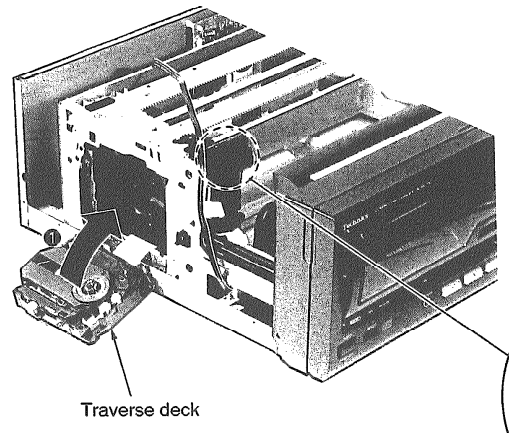
⇩

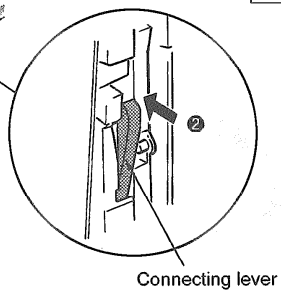
CD play starts.

⇩

Check the servo module.

Act.2 | Independent traverse deck | Reassembly

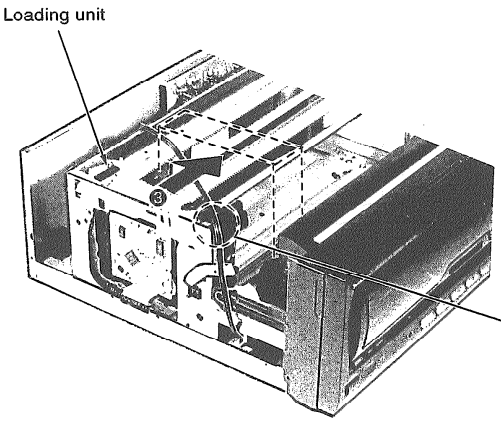


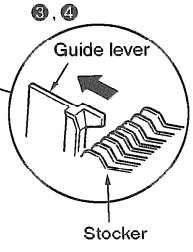


❶ Equip the traverse deck with the loading unit.

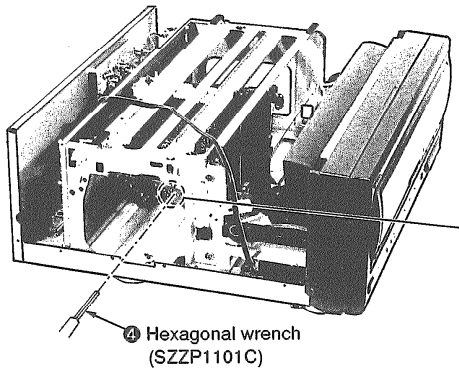
❷ Push the guide lever in the direction of arrow with supporting manually not to be fall free the traverse deck.

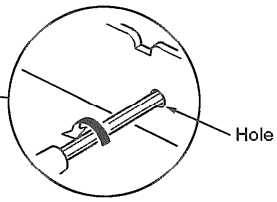
The traverse deck will not fall free as shown above.



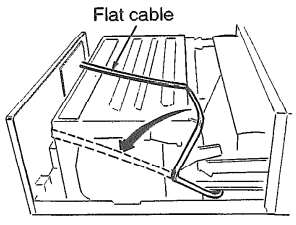


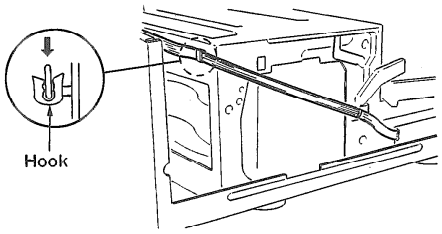
❸ Move the guide lever in the direction of arrow and then, move the loading unit to the center with relieving the engagement to stocker.





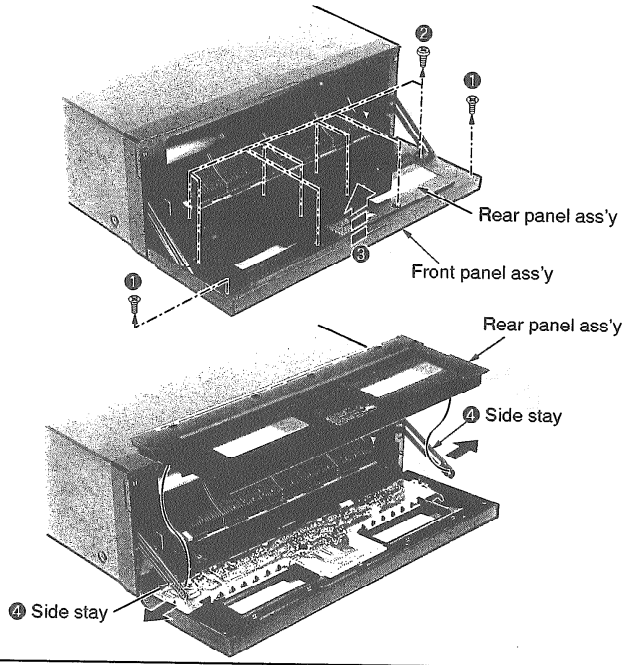
❹ With keeping the guide lever in the direction of arrow, rotate the reduction gear to counterclockwise fulley with 2mm type hexagonal wrench(SZZP1101C)





※ Arrange the flat cable in original form.

Act.3 Front panel Disassembly



❶ Remove the 2 countersunk screws.

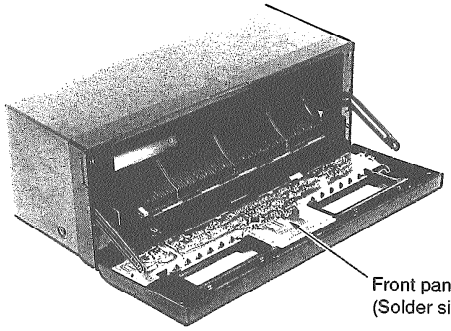
❷ Remove the 10 screws.

❸ Lift up the rear panel ass'y.

❹ Remove the rear panel ass'y with releasing the both side stays.

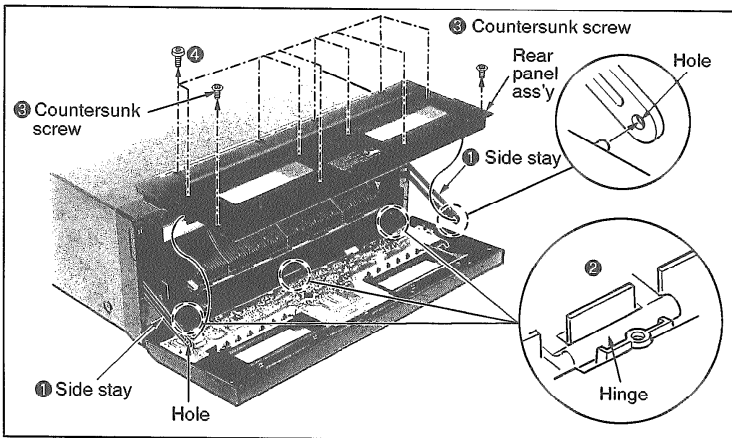
❶	❷
ϕ 2.6 × 7mm	ϕ 2.6 × 10mm

Act.3 Front panel Operation checks



• Perform the operation checks in the state as shown left.

Act.3 Front panel Reassembly



❶ Align the both of back panel with the hole of side stays.

❷ Install the hinges to the rear panel ass'y.

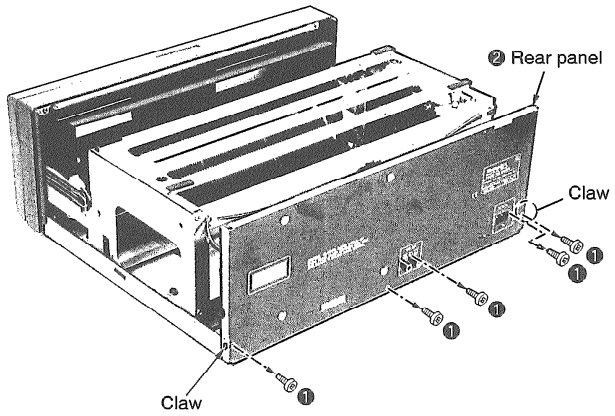
❸ Install the 2 countersunk screws.

Make sure that the countersunk screws are in correct position.

❹ Install the 10 screws.

❸	❹
ϕ 2.6 × 7mm	ϕ 2.6 × 10mm

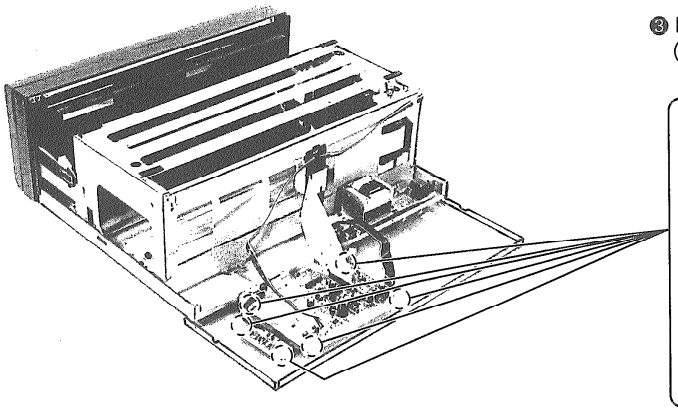
Act.3 | Main P.C.B. and disc signal P.C.B. | Disassembly



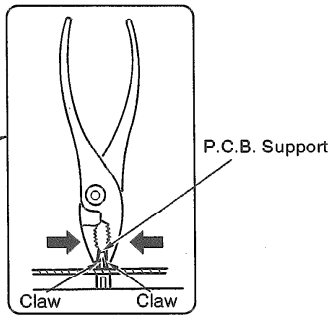
❶ Remove the 5 screws.

❶ (Black)
ϕ 3 × 8mm

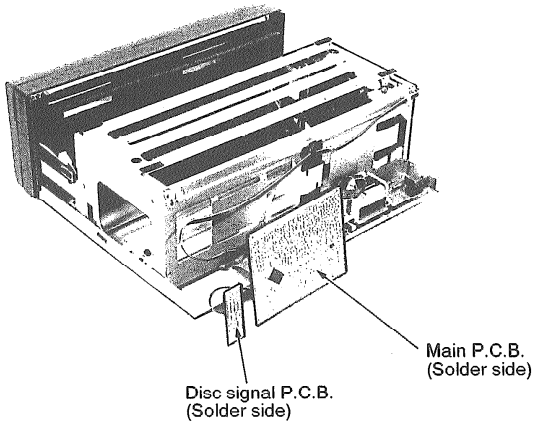
❷ Release the 2 claw, and then remove the rear panel.



❸ Release the P.C.B. supports from the main P.C.B.. (Pinch the claws of P.C.B. supports with plier as shown below.)



Act.3 | Main P.C.B. and disc signal P.C.B. | Operation checks



• Perform the operation checks in the state as shown left.

Act.3 | Main P.C.B. and disc signal P.C.B. | Reassembly

For reassembly after operation check, perform in reverse order of disassembly (❶–❸).

Measurements and Adjustments

Warning: This product uses a laser diode. Refer to caution statements on page 2.

Measuring Instruments and Special Tools

- Test discs
  1. Playability test disc (SZZP1054C)
  2. Uneven test disc (SZZP1056C)
- Musical program disc (ordinary)
- DC electronic voltmeter (EVM)

PREPARATION

1. Remove the loading unit as shown in Fig. 1.
   (Refer to "Handling of the loading unit" on pages 28, 29.)
2. Set the unit in the test mode as follows: hold the STOP and PLAY keys on and set the POWER switch to ON.
   (Refer to "Test mode setting" on page 21.)
3. Follow the adjustment procedure.

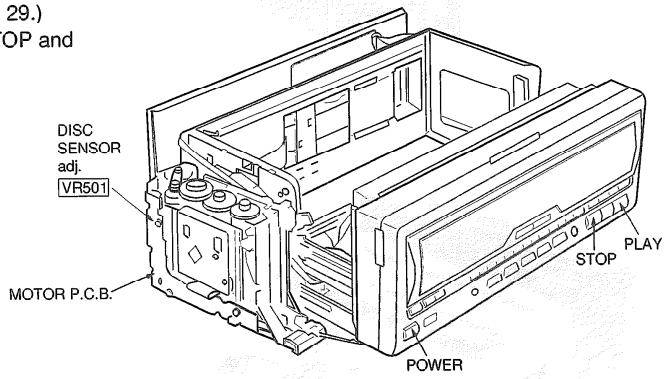


Fig. 1

(1) DISC SENSOR ADJUSTMENT

1. Unsolder the short land to open circuit as shown in Fig. 2.
2. Connect the DC electronic voltmeter across TP501 (+) and TP502 (−) on the motor P.C.B. as shown in Fig. 2.
3. Adjust **VR501** so that the DC electronic voltmeter read **2.8± 0.1V.**
4. Short-circuit the land by soldering after adjustment as shown in Fig. 2.

(2) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

*** Checking Skip Search**

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

*** Checking Manual Search**

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

*** Checking Playability**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

• Adjustment points

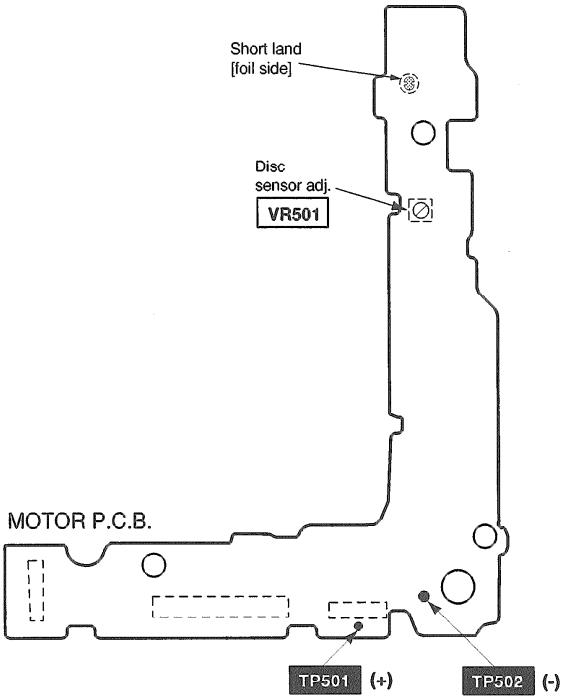


Fig. 2

• Terminal guide of IC's, transistors and diodes.

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 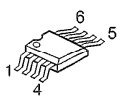 </td>
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 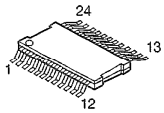 </td>
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 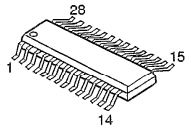 </td>
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 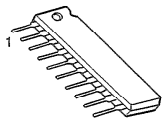 </td>
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 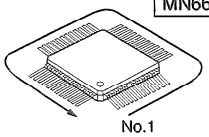 </td>
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 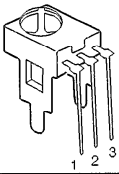 </td>
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 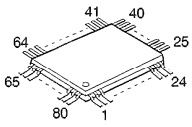 </td>
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 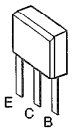 </td>
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 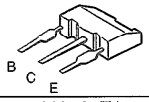 </td>
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 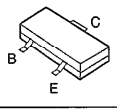 </td>
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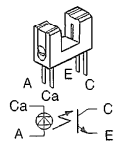
<td>  </td>
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 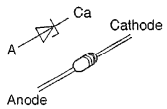 </td>
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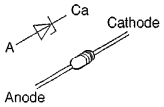
MA4062MTA
MA4075MTA
MA4091MTA
  </td>
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 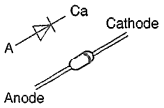 </td>
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 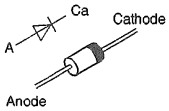 </td>
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 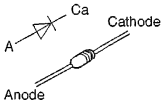 </td>
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 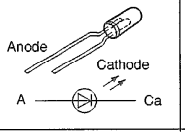 </td>
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 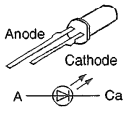 </td>
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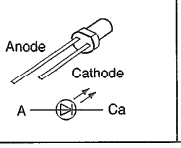
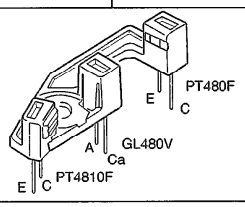
  </td>
<td colspan="2">  </td>
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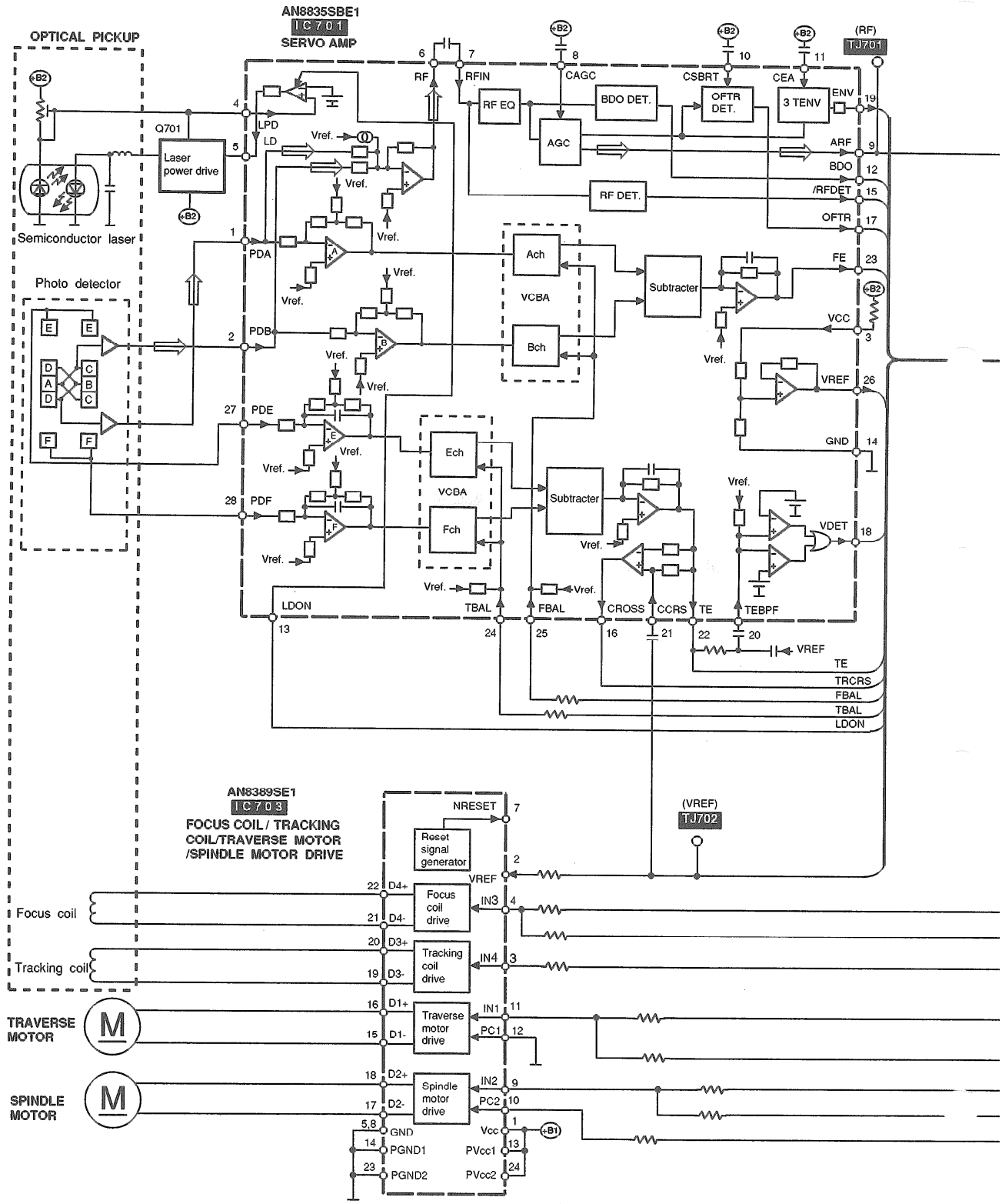
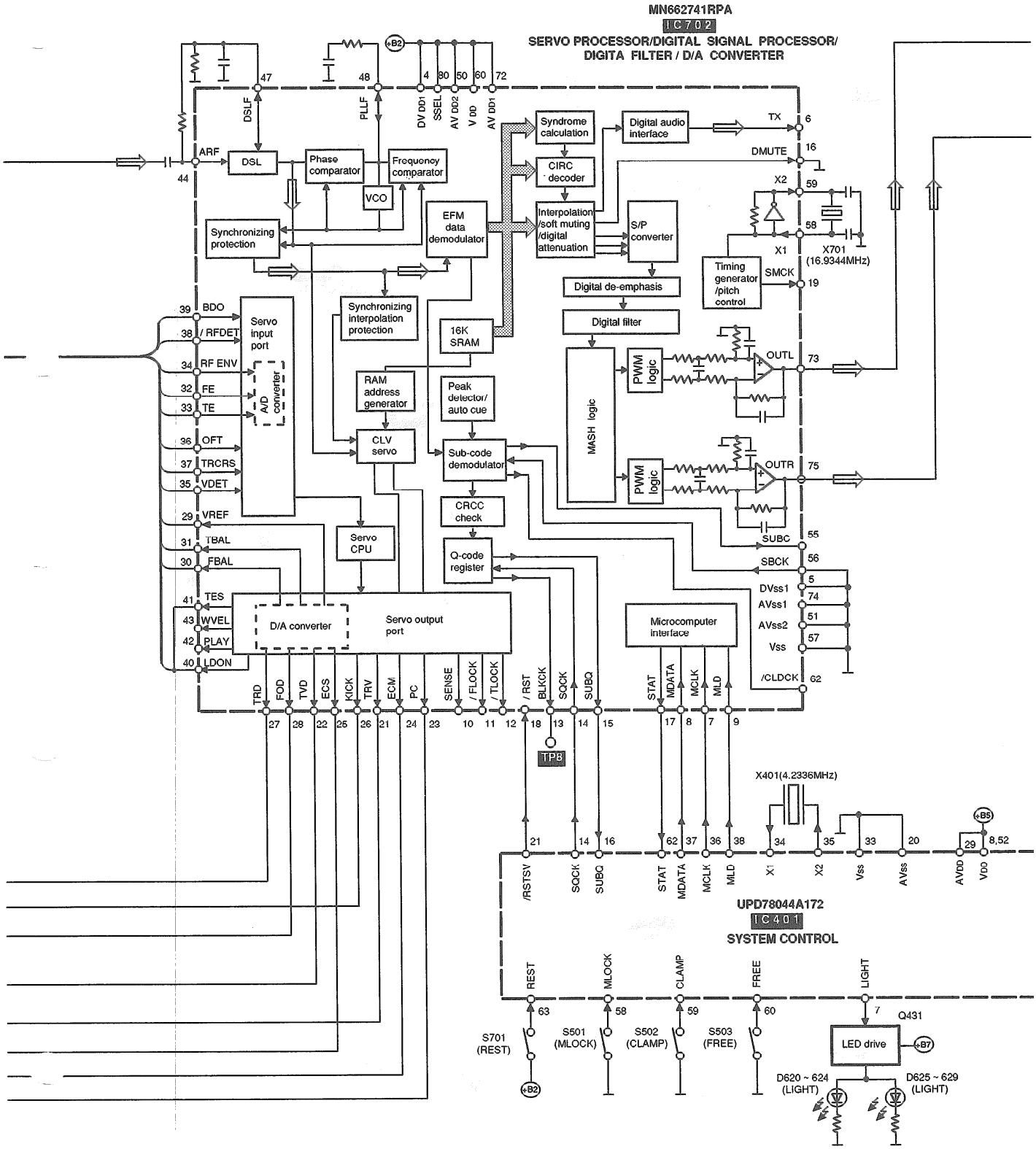
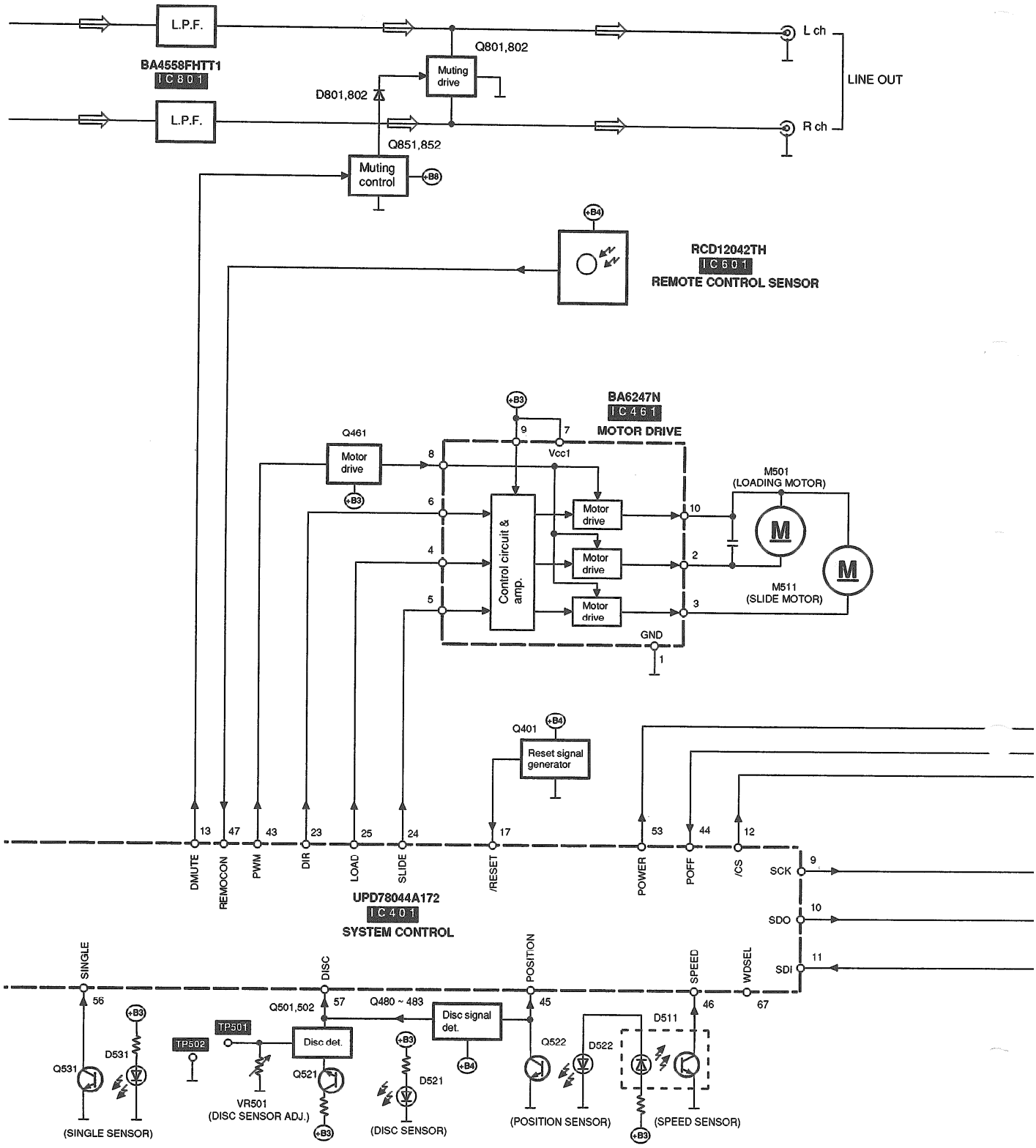
Block Diagram

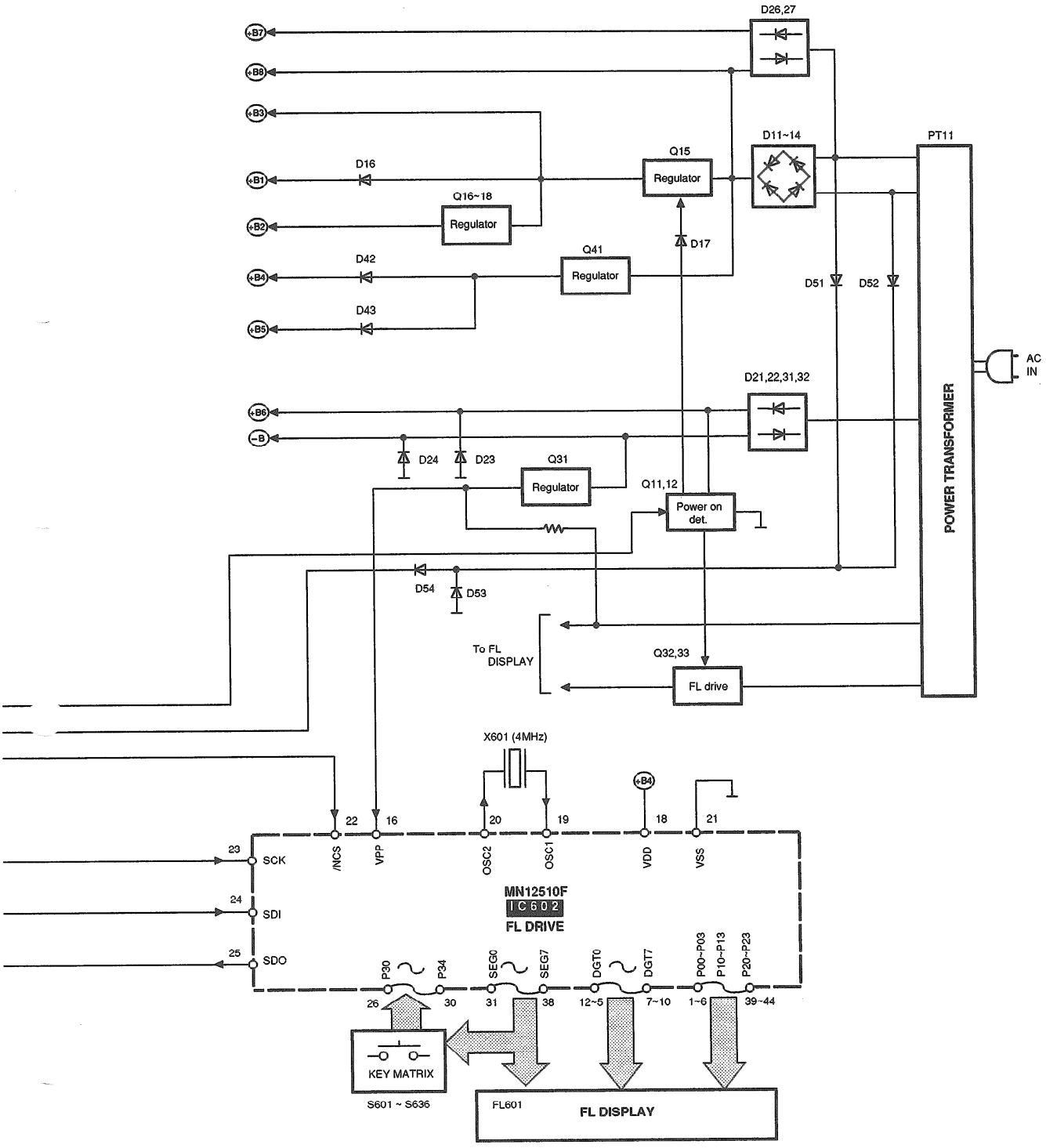


● Signal line ⇨ : Audio signal



● Signal line ⇨ : Audio signal




D26,27
+B7
+B8
+B3
+B1
+B2
+B4
+B5
+B6
-B
D16
Q16~18
Regulator
Q15
Regulator
D11~14
PT11
D17
Q41
Regulator
D42
D43
D51
D52
AC IN
D21,22,31,32
D24
D23
Q31
Regulator
Q11,12
Power on det.
POWER TRANSFORMER
D54
D53
To FL DISPLAY
Q32,33
FL drive
X601 (4MHz)
22
16
20
19
18
21
23
24
25
SCK
SDI
SDO
/NCS
VPP
OSC2
OSC1
VDD
VSS
MN12510F
IC602
FL DRIVE
P30
P34
SEG0
SEG7
DGT0
DGT7
P00~P03
P10~P13
P20~P23
26
30
31
38
12~5
7~10
1~6
39~44
KEY MATRIX
S601 ~ S636
FL601
FL DISPLAY

Terminal Guide

● IC401 (UPD78044A172): System control

Pin No.	Mark	I/O Division	Function
1 ~ 6	NONE	—	Not connected
7	LIGHT	O	Not used, open
8	VDD	I	Power supply terminal
9	SCK	O	Serial clock output terminal
10	SDO	O	Serial data output terminal
11	SDI	I	Serial data input terminal
12	/CS	O	Chip select terminal
13	DMUTE	O	Muting control signal
14	SQCK	O	sub-code Q register clock
15	NC	—	Not connected
16	SUBQ	I	Sub-code Q data
17	/RESET	I	Reset signal input
18	NONE	—	Not connected
19	KBDATA	O	Keyboard data signal (Not used open)
20	AVSS	—	GND terminal
21	/RSTSV	O	Reset signal output
22	/LCK	O	Not used, open
23	DIR	O	Motor control signal
24	SLIDE	O	Motor control signal
25	LOAD	O	Motor control signal
26	KBCS	O	Chip select terminal (Not used, open)
27	SEL 1	—	Not used, connected to GND
28	KBCLK	O	Serial clock terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
29	AVDD	I	Power supply terminal
30	AVREF	I	Power supply terminal (Not used, connected to GND)
31	XT1	—	Not used, connected to GND
32	XT2	—	Not used, open
33	VSS	—	GND terminal
34	X1	I	Crystal Osc terminal (f=4.2336MHz)
35	X2	O	
36	MCLK	O	Command clock signal
37	MDATA	O	Command data signal
38	MLD	O	Command load signal ("L" LOAD)
39	EPCLK	O	Not used, open
40	EPSO	I	Not used, open
41	/EPCS	O	Not used, open
42	/EPHOLD	O	Not used, open
43	PWM	O	Motor control signal
44	POFF	I	Power det. terminal
45	POSITION	I	Rotary tray position det. terminal
46	SPEED	I	Loading motor speed sensor signal
47	REMOCON	I	Remote control signal input
48	IC	—	Not used, connected to GND
49 ~ 51	NONE	—	Not connected
52	VDD	I	Power supply terminal
53	POWER	O	Power ON/OFF output terminal

Pin No.	Mark	I/O Division	Function
54	EPSI	O	Serial data input terminal (Not used, OPEN)
55	NONE	—	Not connected
56	SINGLE	I	Disc slot det. terminal for single play
57	DISC	I	Disc control signal
58	MLOCK	I	Mechanism det. terminal (S501)
59	CLAMP	I	Mechanism det. terminal (S502)
60	FREE	I	Mechanism det. terminal (S503)
61	PHSEL1	—	Not connected
62	STAT	I	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
63	REST	I	Rest position det.

Pin No.	Mark	I/O Division	Function
64	PHSEL2	—	Not connected
65	STP 1	—	Not used, connected to GND
66	STP 2	—	Not used, connected to GND
67	WDSEL	—	Not connected
68	LED 3	O	LED drive signal
69 ~ 70	NONE	—	Not connected
71	VPP	I	Power supply terminal (Not used, connected to GND)
72 ~ 80	NONE	—	Not connected

● IC602 (MN12510F): FL drive

Pin No.	Mark	I/O Division	Function
1 ~ 2	P21 ~ P20	O	Segment signal of FL display
3 ~ 6	P03 ~ P00	O	Segment signal of FL display
7 ~ 10	DGT7 ~ DGT4	O	Grid signal of FL display
11	NC	—	Not connected
12 ~ 15	DGT3 ~ DGT0	O	Grid signal of FL display
16	VPP	I	Power supply terminal
17	NC	—	Not connected
18	VDD	I	Power supply terminal
19	OSC 1	I	Crystal Osc terminal (f=4.2326MHz)
20	OSC 2	O	

Pin No.	Mark	I/O Division	Function
21	VSS	—	GND terminal
22	/NCS	I	Chip select terminal
23	SCK	I	Serial clock input terminal
24	SDI	I	Serial data input terminal
25	SDO	O	Serial data output terminal
26 ~ 30	P30 ~ P34	I	Key return signal
31 ~ 38	SEG 0 ~ SEG 7	O	Segment signal of FL display and key scan signal
39 ~ 42	P 10 ~ P 13	O	Segment signal of FL display and key scan signal
43 ~ 44	P 23 ~ P 22	O	Segment signal of FL display and key scan signal

● IC702 (MN662741RPA): Servo processor/ digital signal processor/ digital filter D/A converter

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial bit clock terminal
2	LRCK	O	L/R discriminating signal
3	SRDATA	O	Serial data (Not used, open)
4	$DV_{DD}1$	I	Power supply (digital circuit) terminal
5	DV_{SS} 1	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Command clock signal
8	MDATA	I	Command data signal
9	MLD	I	Command load signal ("L":LOAD)
10	SENSE	O	Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Optical servo condition (focus) ("L": lead-in)
12	/TLOCK	O	Optical servo condition (tracking) ("L": lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz) (Not used, open)
14	SQCK	I	Sub-code Q register clock
15	SUBQ	O	Sub-code Q data
16	DMUTE	I	Muting input ("H": MUTE) (Not used, connected to GND)
17	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
18	/RST	I	Reset signal ("L": reset)
19	SMCK	O	System clock (f=4.2336MHz) (Not used, open)
20	PMCK	O	Frequency division clock signal (No used, open) ($f=\frac{1}{1.92}$ x ck=88.2kHz)
21	TRV	O	Traverse servo control

Pin No.	Mark	I/O Division	Function
22	TVD	O	Traverse drive signal
23	PC	O	Turntable motor drive signal ("L": ON)
24	ECM	O	Turntable motor drive signal (Forced mode)
25	ECS	O	Turntable motor drive signal (Servo error signal)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drived output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal
30	FBAL	O	Focus balance adj. output (Not used, open)
31	TBAL	O	Tracking balancef adj. output
32	FE	I	Focus error signal (analog input)
33	TE	I	Tracking error signal (analog input)
34	RFENV	I	RF envelope signal
35	VDET	I	Oscillation det. signal ("H": det.)
36	OFT	I	Off track signal ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal ("L": detection)
39	BDO	I	Dropout detection signal ("H": dropout)
40	LDON	O	Laser power control ("H": ON)
41	TES	O	Tracking error shunt output ("H": dropout)
42	PLAY	O	Play signal ("H": play) (Not used, open)

Pin No.	Mark	I/O Division	Function
43	WVEL	O	Double velocity status signal ("H": double) (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias terminal (Not used, open)
47	DSLF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal
50	AVDD2	I	Power supply (analog circuit) terminal(2)
51	AVss2	—	GND (analog circuit) terminal
52	EFM	O	EFM signal (Not used, open)
53	PCK	O	PLL extract clock (f= 4.3218MHz) (Not used, open)
54	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)
55	SUBC	O	Sub-code serial output clock (Not used, open)
56	SBCK	I	Sub-code serial input data (Not used, connected to GND)
57	V ss	—	GND terminal
58	X1	I	Crystal oscillator terminal (f=16.9344MHz)
59	X2	O	
60	VDD	I	Reset signal ("L": reset)
61	BYTCK	O	Byte clock signal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal (f CLDCK=7.35KHz: Normal) (Not used, open)
63	FCLK	O	Crystal frame clock (Not used, open)
64	IPFLAG	O	Interpolation flag terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
65	FLAG	O	Flag terminal (Not used, open)
66	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check terminal ("H": ON, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
70	/RST2	I	Reset terminal after " MASH" circuit (Not used, connected to power supply)
71	/TEST	I	Test terminal (Normal: "H") (Not used, connected to power supply)
72	AVDD1	I	Power supply (analog circuit) terminal (1)
73	OUTL	O	Lch audio signal
74	AV ss1	—	GND (analog circuit) terminal (1)
75	OUTR	O	Rch audio signal
76	RSEL	I	Polarity direction control terminal of RF signal (Not used, connected to power supply
77	CSEL	I	Frequency control terminal of crystal oscillator (Not used, connected to GND)
78	PSEL	I	Test terminal (Normal:"L") (Not used, connected to GND)
79	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz) (Not used, connected to GND)
80	SSEL	O	"SUBQ" terminal mode select ("H": Q code buffer) (Not used, connected to power supply

● IC701 (AN8835SBE1): Servo amp

Pin No.	Mark	I/O Division	Function
1	PDA	I	Focus signal input terminal 1 (Ach)
2	PDB	I	Focus signal input terminal 2 (Bch)
3	VCC	I	Power supply terminal
4	LPD	I	Laser PD signal
5	LD	O	Laser power auto control output
6	RF	O	RF amp terminal
7	RF IN	I	AGC input terminal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Dropout detection control
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	GND	—	GND terminal

Pin No.	Mark	I/O Division	Function
15	/RFDET	O	RF det. signal ("L": det.)
16	CROSS	O	Tracking error zero cross output
17	OFTR	O	Off track detection ("H": det.)
18	VDET	O	Oscillation det. signal ("H": det.)
19	ENV	O	Envelope output terminal
20	TEBPF	I	Oscillation detect input terminal (Not used, open)
21	CCRS	I	CROSS capacitor connection terminal
22	TE	O	Tracking error signal
23	FE	O	Focusing error signal
24	TBAL	I	Tracking balance adj. input
25	FBAL	I	Focus balance adj. input
26	VREF	O	Reference voltage output
27	PDE	I	Tracking signal input terminal 1 (Ech)
28	PDF	I	Tracking signal input terminal 2 (F ch)

● IC703(AN8389SE1): Focus coil/ tracking coil/ traverse motor/ spindle motor drive

Pin No.	Mark	I/O Division	Function
1	Vcc	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	GND terminal
6	NC	—	Not used, connected to GND
7	NRESET	O	Reset terminal (Not used, open)
8	GND	—	GND terminal
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut)input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
13	PVcc1	I	Driver power supply (1)
14	PGND1	—	Driver GND terminal (1)
15	D1-	O	Motor driver (1) output terminal (-)
16	D1+	O	Motor driver (1) output terminal (+)
17	D2-	O	Motor driver (2) output terminal (-)
18	D2+	O	Motor driver (2) output terminal (+)
19	D3-	O	Motor driver (3) output terminal (-)
20	D3+	O	Motor driver (3) output terminal (+)
21	D4-	O	Motor driver (4) output terminal (-)
22	D4+	O	Motor driver (4) output terminal (+)
23	PGND2	—	Driver GND terminal (2)
24	PVcc2	I	Driver power supply (2)

■ Schematic Diagram (Parts list on pages 70~73.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note:

- **S501**: Lock det. switch. (MLOCK)
- **S502**: Clamp det. switch. (CLAMP)
- **S503**: Clamp det. switch. (FREE)
- **S601**: Stop (■) switch.
- **S602, 603**: Disc skip switches. (S602: +, S603: –)
- **S604**: Programming (PROGRAM) switch.
- **S605**: Single play (SINGLE ▶) switch.
- **S606**: Pause (▮▮) switch.
- **S607, 608**: Track skip switches. (S607: ▶▶I , S608: I◀◀)
- **S609**: Direct programming (DIRECT) switch
- **S610**: Power "STANDBY ⏻ /ON" (POWER, STANDBY ⏻ ON) switch.
- **S611**: Play (▶) switch.
- **S612, 613**: Search (SEARCH) switches. [S612: ▶▶ , S613: ◀◀]
- **S614**: Group enter (GROUP ENTER) switch.
- **S615**: OPEN/CLOSE det. switch.
- **S616~620**: Disc group (DISC GROUPING PLAY) switches.
  [S616: A, S617: B, S618: C, S619: D, S620: E]
- **S621~631**:
  Numeric (1~9, 0, ≥ 10) switches.
  (S621: (0), S622: (1), S623 (2), S624: (3), S625: (4), S626: (5), S627: (6), S628: (7), S629: (8), S630: (9), S631: (≥ 10))
- **S633**: Disc selector (DISC) switch .
- **S634**: Disc enter (DISC ENTER) switch.
- **S636**: ID scan (ID SCAN) switch.
- **S701**: Rest detector.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occasion calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- ▬▬ / ▬▬▬ : Positive voltage lines and negative voltage lines.
- ⟹ : audio signal lines.

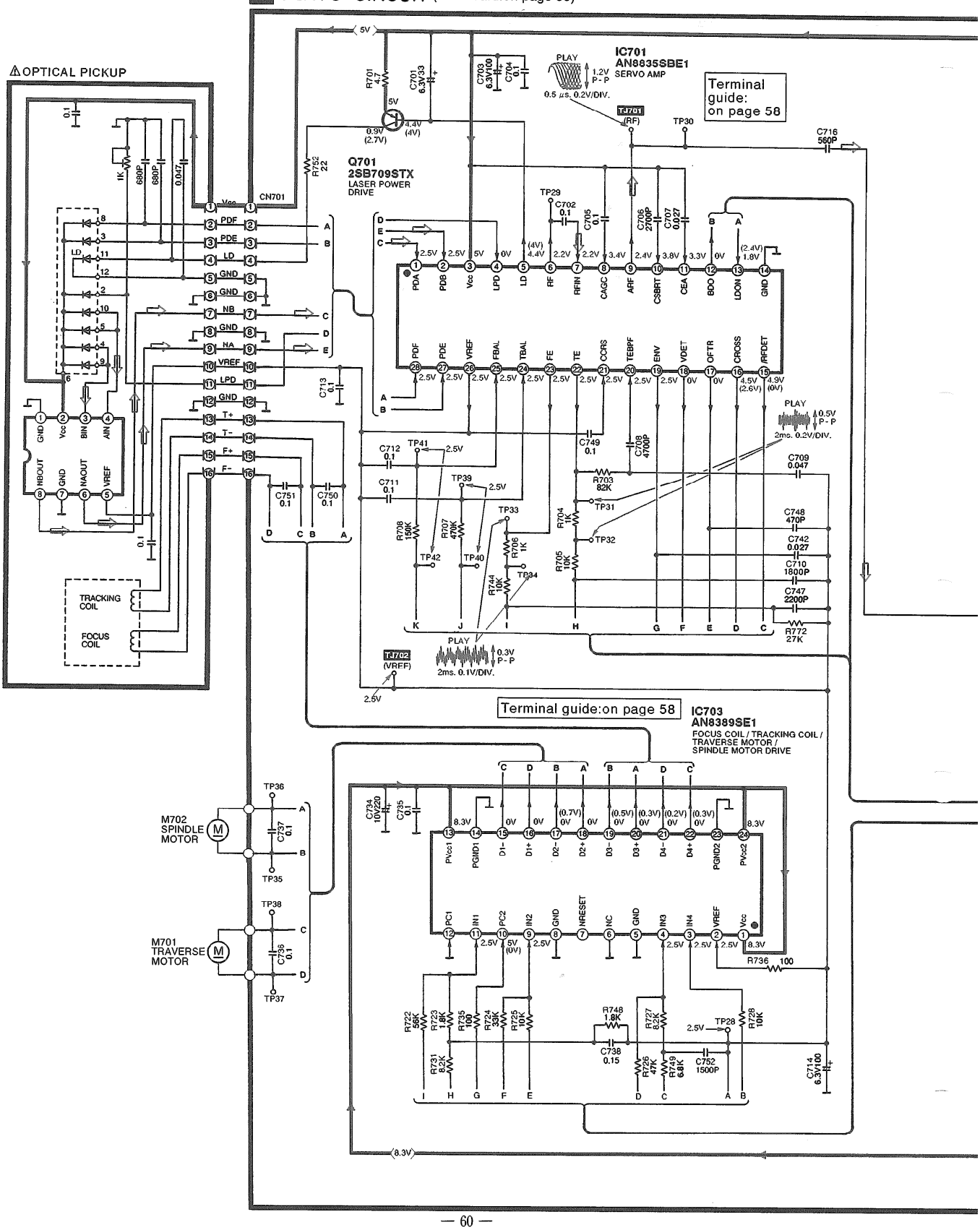
Caution!

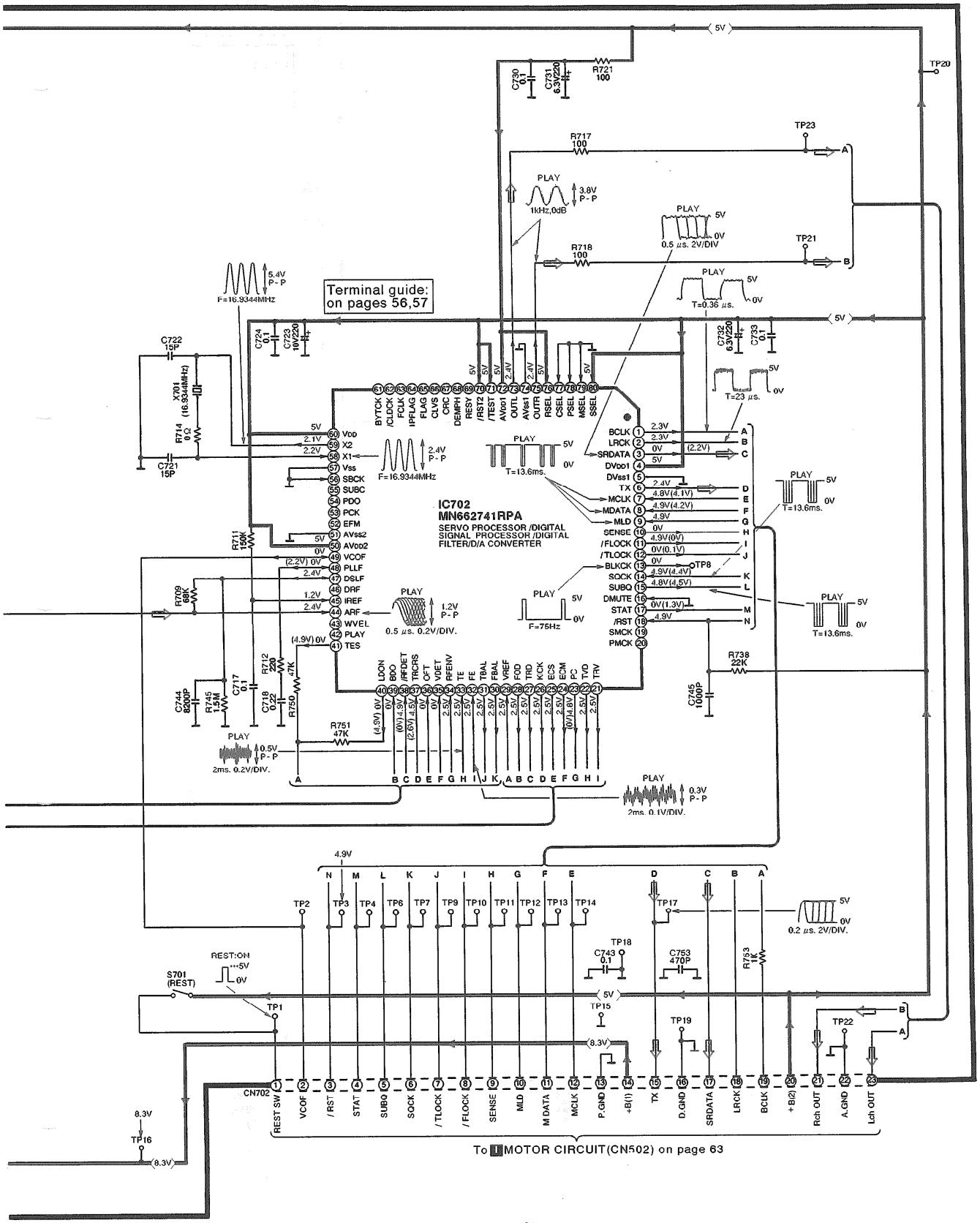
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

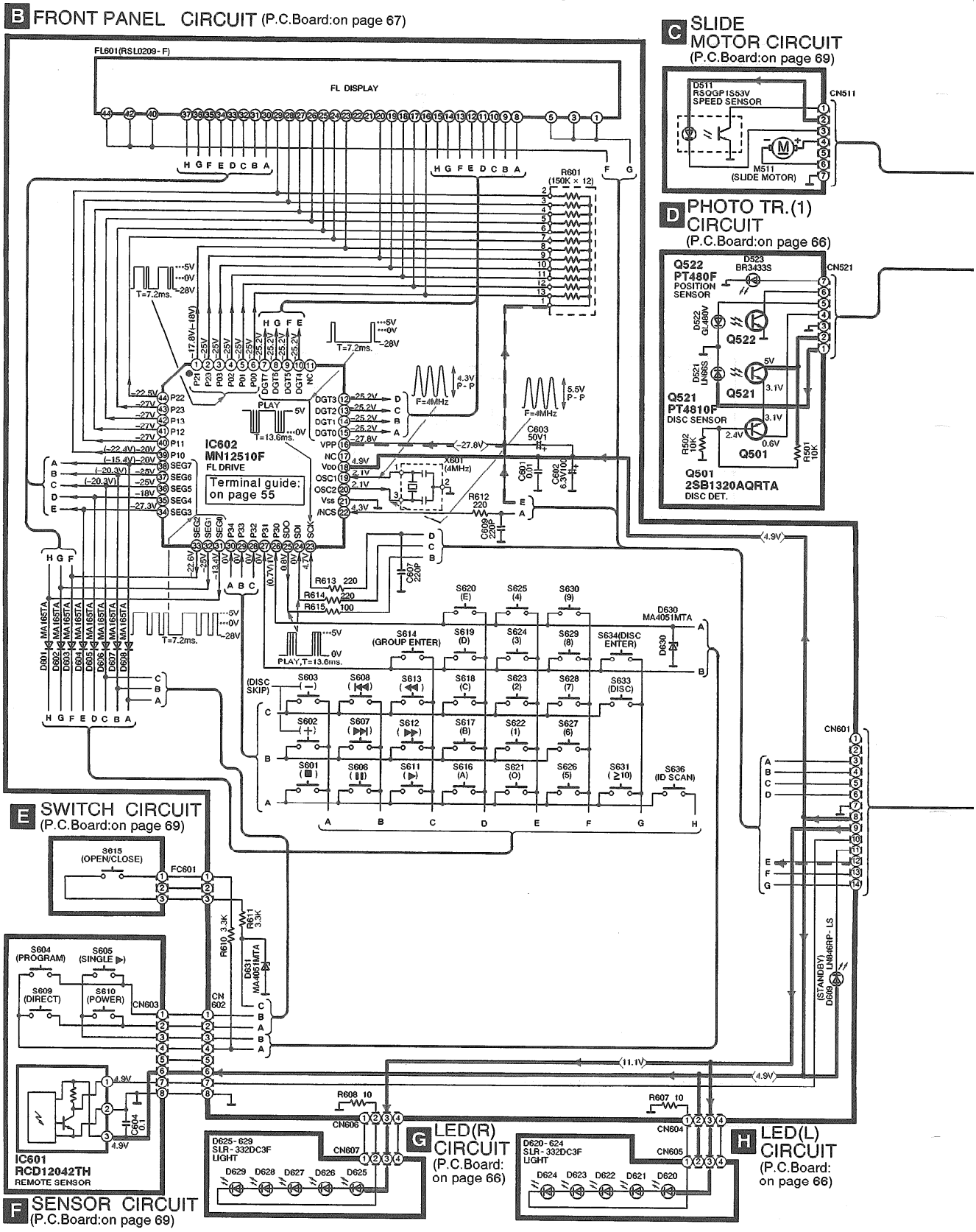
● ⇨ : Audio signal lines.

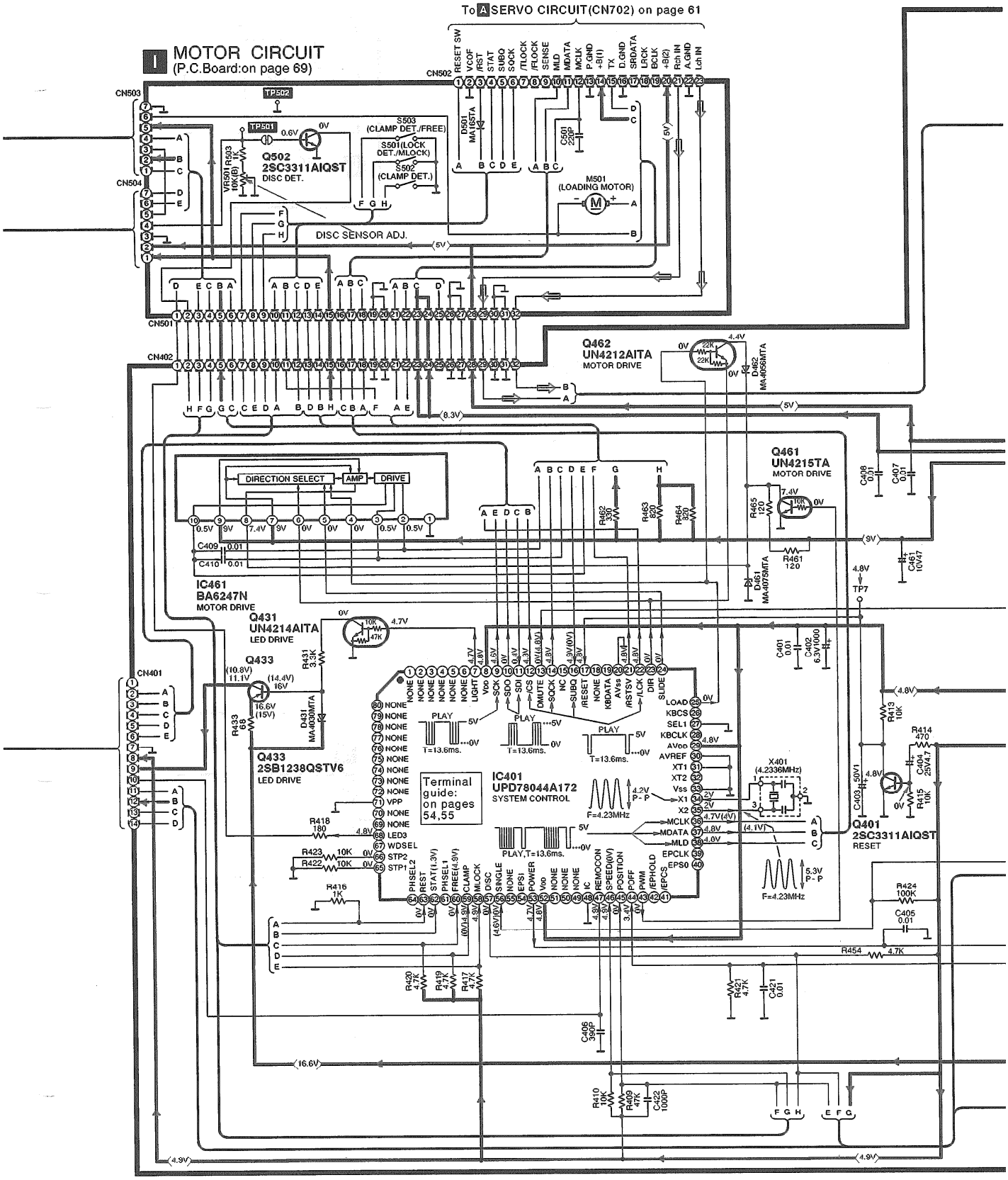
A SERVO CIRCUIT (P.C.Board:on page 66)



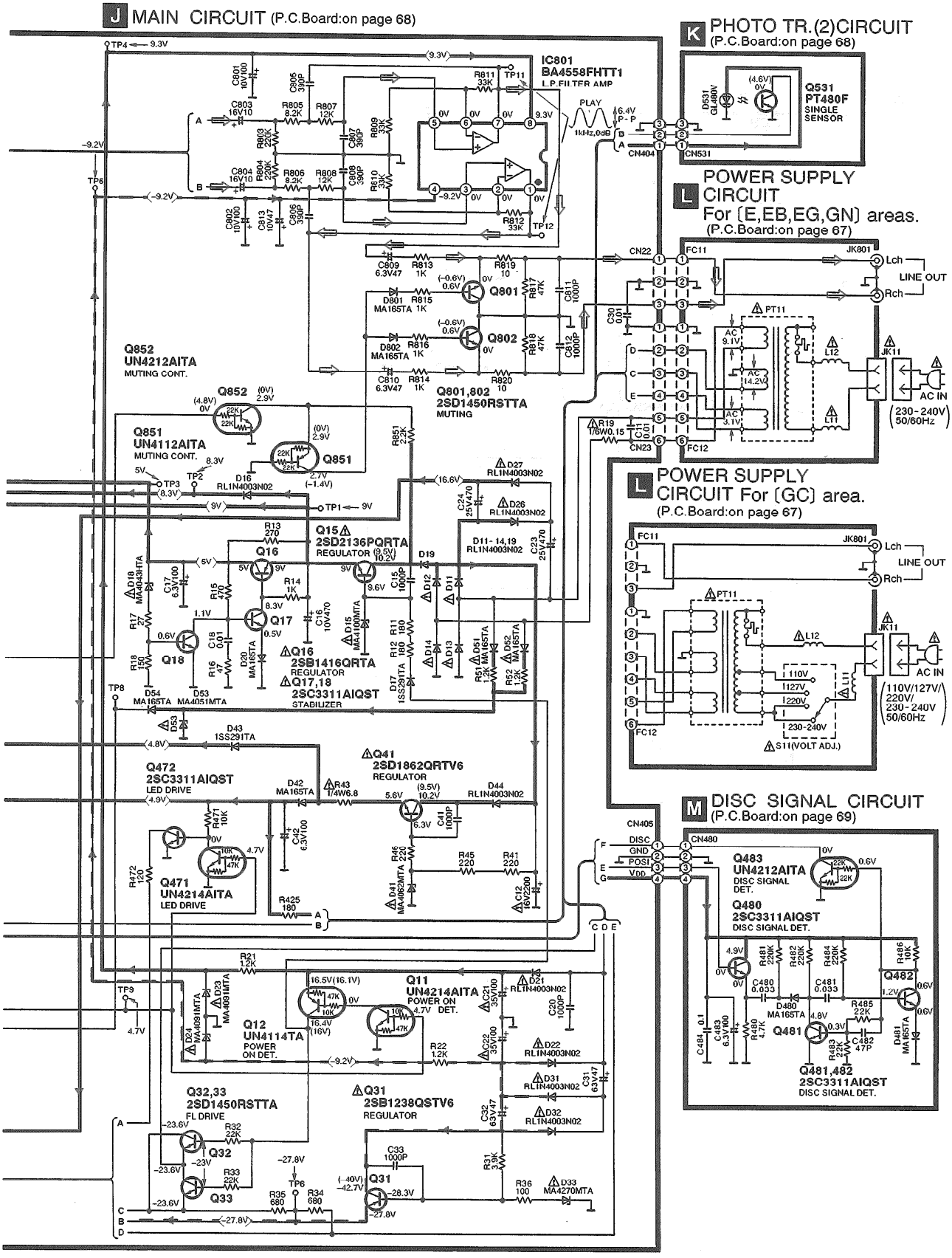

Terminal guide:
on pages 56,57
IC702
MN662741RPA
SERVO PROCESSOR /DIGITAL
SIGNAL PROCESSOR /DIGITAL
FILTER/D/A CONVERTER
To MOTOR CIRCUIT(CN502) on page 63

● ⟹ : Audio signal lines.

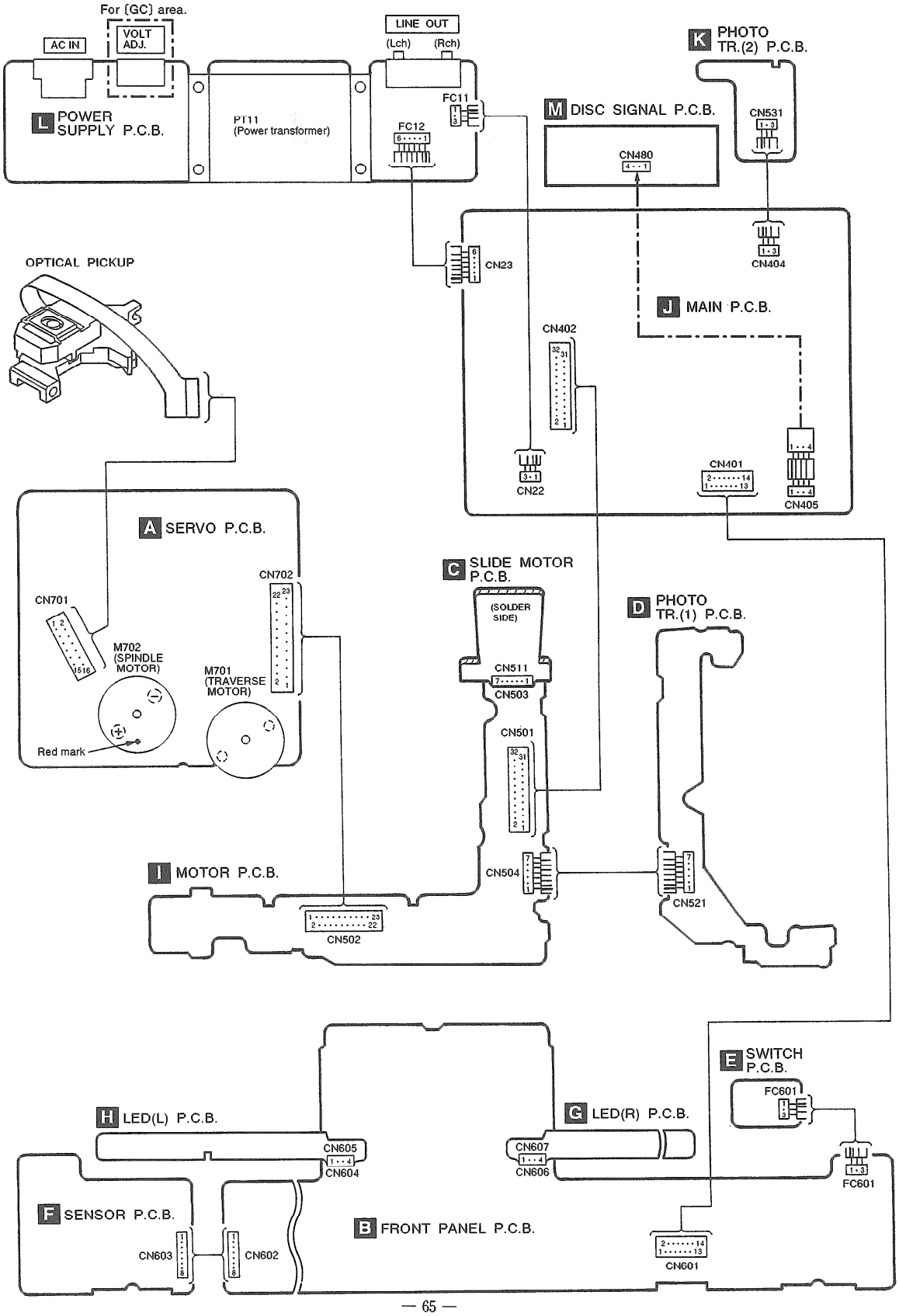



To A SERVO CIRCUIT(CN702) on page 61
I MOTOR CIRCUIT
(P.C.Board:on page 69)
CN502
CN503
CN504
CN501
CN402
CN401
TP502
TP501
Q502
2SC3311AIQST
DISC DET.
S503
(CLAMP DET./FREE)
S501(LOCK DET./MLOCK)
S502
(CLAMP DET.)
M501
(LOADING MOTOR)
DISC SENSOR ADJ.
Q462
UN4212AITA
MOTOR DRIVE
Q461
UN4215TA
MOTOR DRIVE
IC461
BA6247N
MOTOR DRIVE
DIRECTION SELECT
AMP
DRIVE
Q431
UN4214AITA
LED DRIVE
Q433
2SB1238QSTV6
LED DRIVE
IC401
UPD78044A172
SYSTEM CONTROL
Terminal guide: on pages 54,55
X401
(4.2336MHz)
Q401
2SC3311AIQST
RESET
PLAY
T=13.6ms.
F=4.23MHz
PLAY,T=13.6ms.
5.3V P-P
4.2V P-P
16.6V
8.3V
9V
5V
4.9V
4.8V

● ⟹ : Audio signal lines.

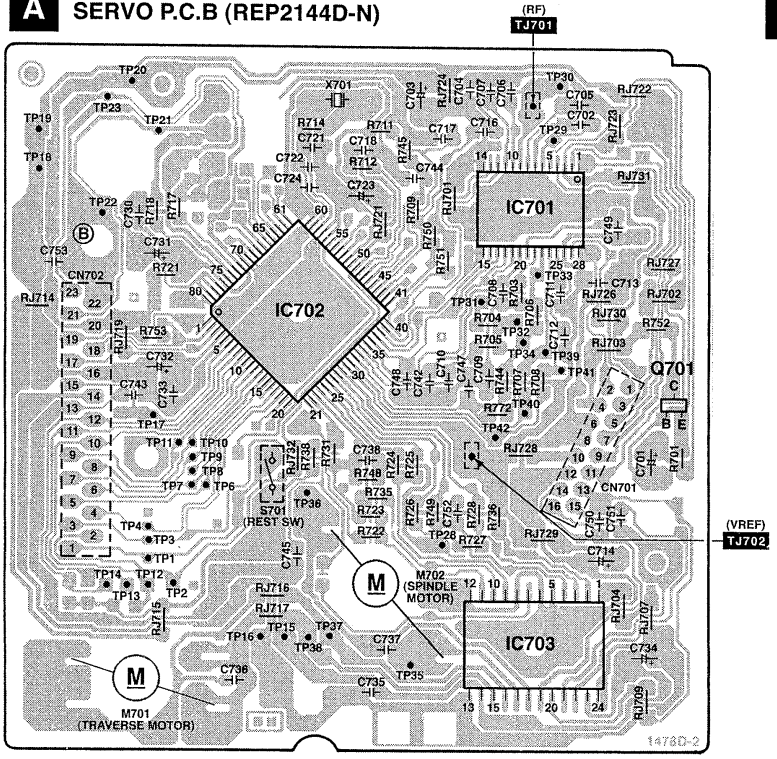


Wiring Connection Diagram

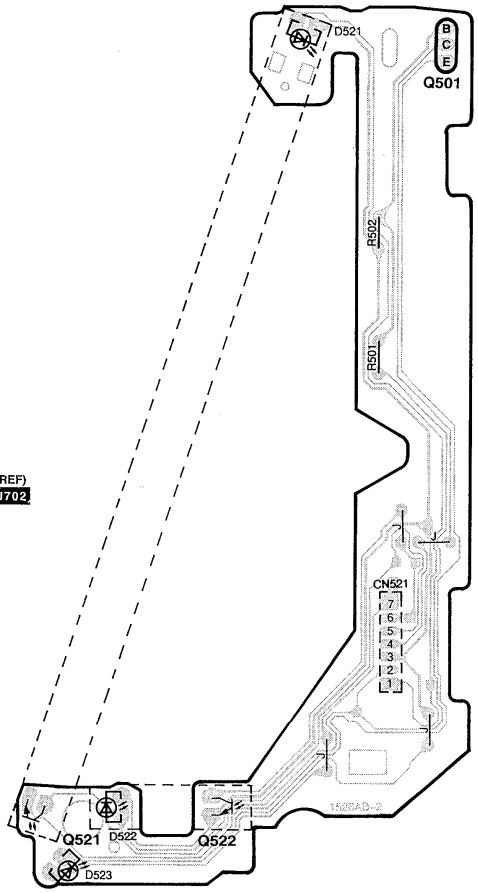


■ Printed Circuit Board Diagram

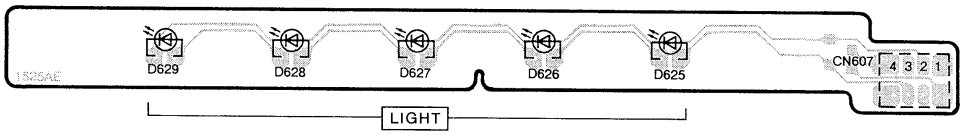
A SERVO P.C.B (REP2144D-N)



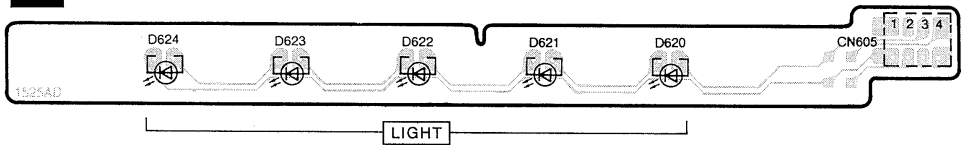
D PHOTO TR.(1) P.C.B. (REP2219A–2N)



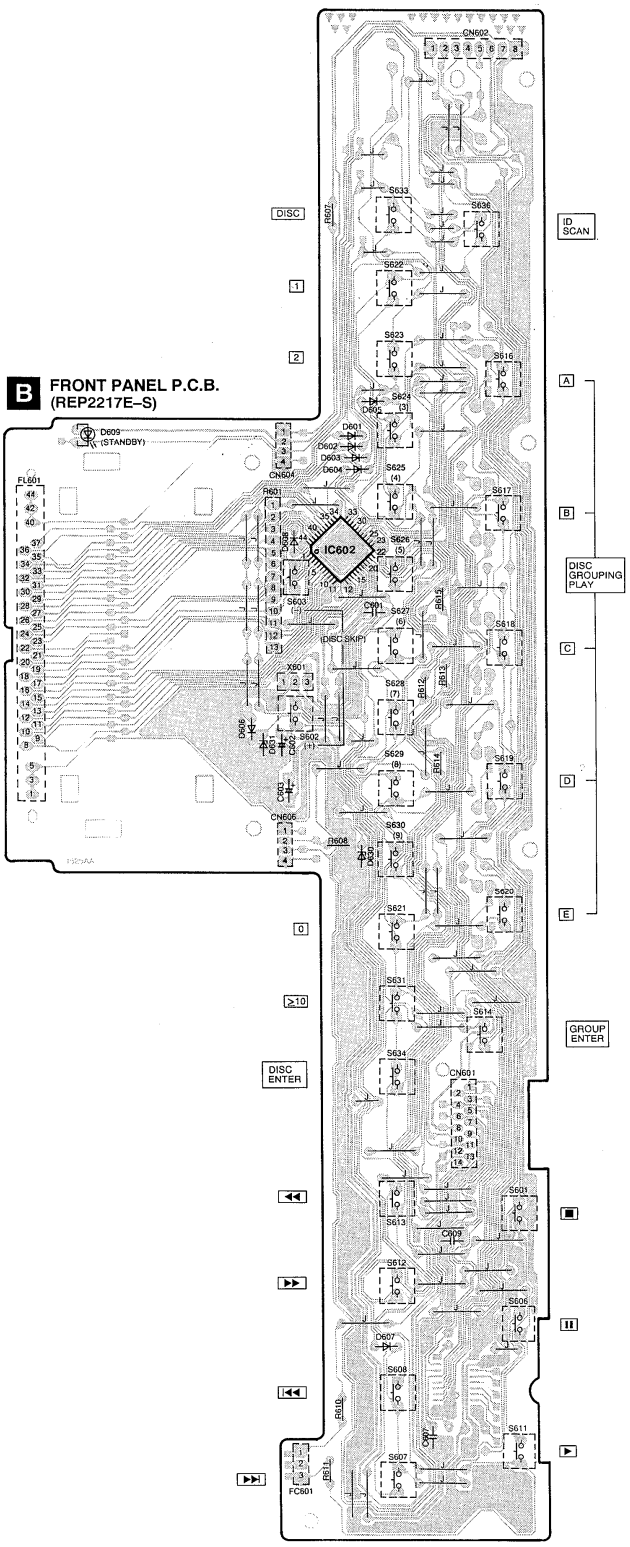
G LED (R) P.C.B. (REP2217E–S)



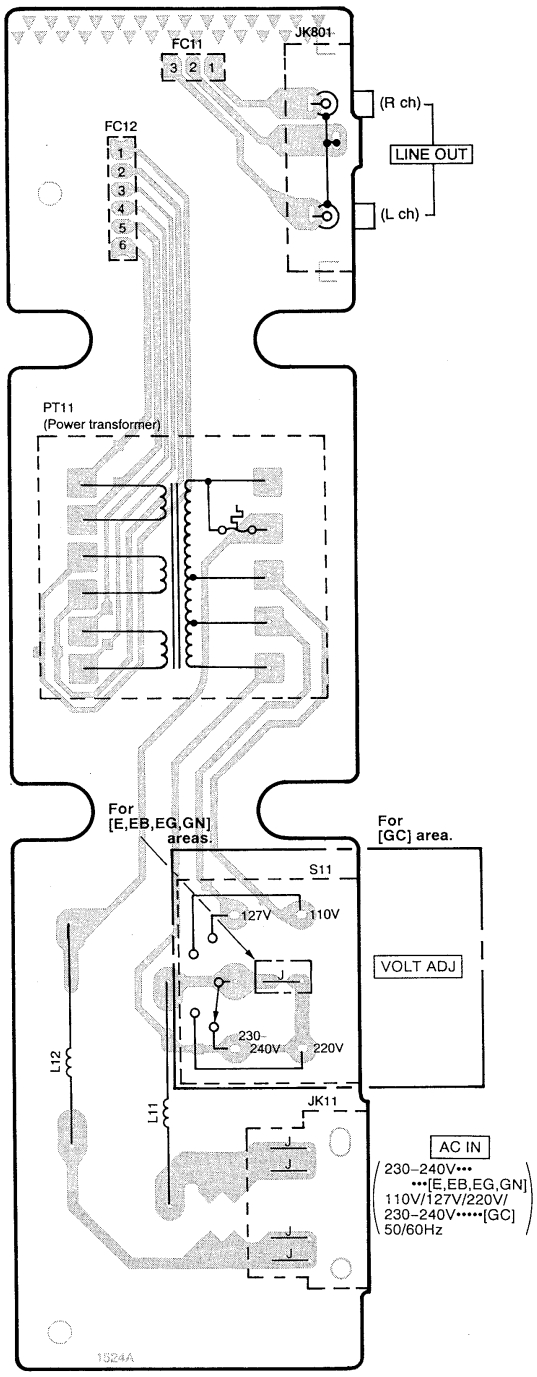
H LED (L) P.C.B. (REP2217E–S)



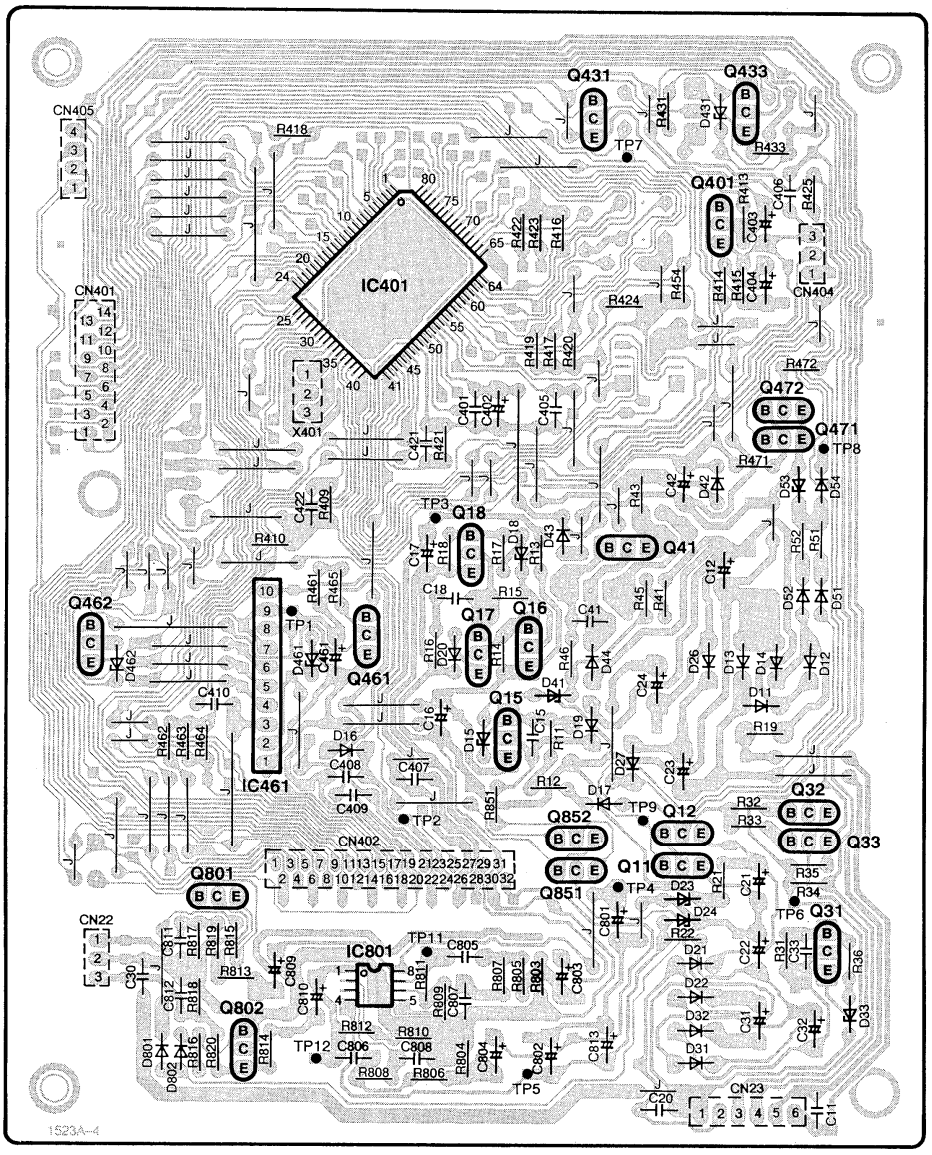
B FRONT PANEL P.C.B. (REP2217E–S)



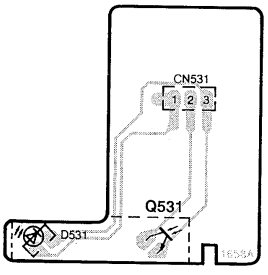
L POWER SUPPLY P.C.B.
(REP2218B–P•••[E,EB,EG] REP2218C–P•••[GN] REP2218D–P•••[GC])



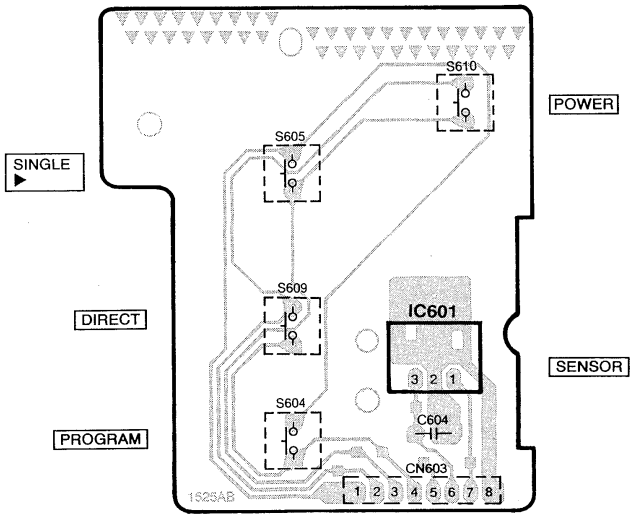
J MAIN P.C.B. (REP2216B–M)



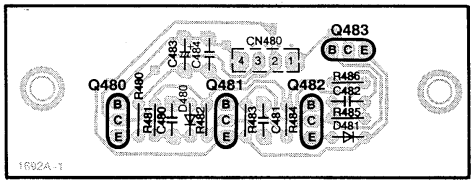
K PHOTO TR.(2) P.C.B. (REP2348A–N)



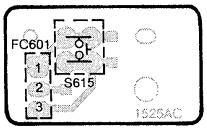
F SENSOR P.C.B. (REP2217E–S)



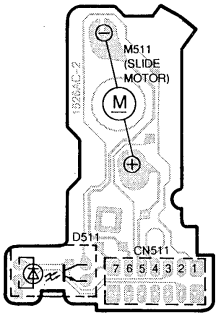
M DISC SIGNAL P.C.B. (REP2385A–N)

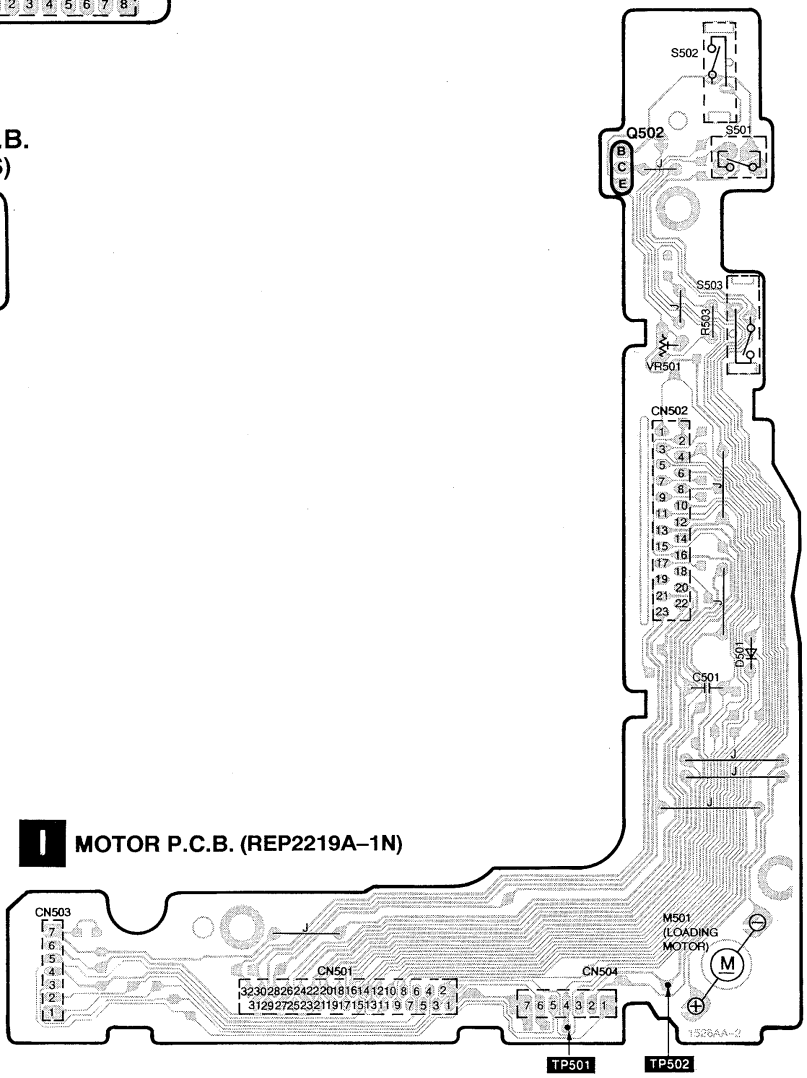


E SWITCH P.C.B. (REP2217E–S)



C SLIDE MOTOR P.C.B. (REP2219A–3N)





I MOTOR P.C.B. (REP2219A–1N)

Replacement Parts List

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC401	UPD78044A172	SYSTEM CONTROL	
IC461	BA6247N	MOTOR DRIVE	
IC601	RCD12042TH	REMOTE CONTROL SENSOR	
IC602	MN12510F	FL DRIVE	
IC801	BA4558FHT1	L. P. F. AMP	
		TRANSISTOR(S)	
Q11	UN4214TA	TRANSISTOR	
Q12	UN4114TA	TRANSISTOR	
Q15	2SD2136PQRTA	TRANSISTOR	⚠
Q16	2SB1416QRTA	TRANSISTOR	⚠
Q17, 18	2SC3311AIQST	TRANSISTOR	⚠
Q31	2SB1238QSTV6	TRANSISTOR	⚠
Q32, 33	2SD1450RTA	TRANSISTOR	
Q41	2SD1862QRTV6	TRANSISTOR	⚠
Q401	2SC3311AIQST	TRANSISTOR	
Q431	UN4214TA	TRANSISTOR	
Q433	2SB1238QSTV6	TRANSISTOR	
Q461	UN4215	TRANSISTOR	
Q462	UN4212TA	TRANSISTOR	
Q471	UN4214TA	TRANSISTOR	
Q472	2SC3311AIQST	TRANSISTOR	
Q480-482	2SC3311AIQST	TRANSISTOR	
Q483	UN4212TA	TRANSISTOR	
Q501	2SB1320AQRTA	TRANSISTOR	
Q502	2SC3311AIQST	TRANSISTOR	
Q521	PT4810F	TRANSISTOR	
Q522	PT480F	TRANSISTOR	
Q531	PT480F	TRANSISTOR	
Q801, 802	2SD1450RTA	TRANSISTOR	
Q851	UN4112	TRANSISTOR	
Q852	UN4212TA	TRANSISTOR	
		DIODE(S)	
D11-14	RL1N4003N02	DIODE	⚠
D15	MA4100MTA	DIODE	⚠
D16	RL1N4003N02	DIODE	
D17	1SS291TA	DIODE	
D18	MA4043HTA	DIODE	⚠
D19	RL1N4003N02	DIODE	
D20	MA165	DIODE	
D21, 22	RL1N4003N02	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D23, 24	MA4091-M	DIODE	
D26, 27	RL1N4003N02	DIODE	
D31, 32	RL1N4003N02	DIODE	⚠
D33	MA4270	DIODE	⚠
D41	MA4062MTA	DIODE	⚠
D42	MA165	DIODE	
D43	1SS291TA	DIODE	
D44	RL1N4003N02	DIODE	
D51, 52	MA165	DIODE	⚠
D53	MA4051MTA	DIODE	⚠
D54	MA165	DIODE	
D431	MA4030MTA	DIODE	
D461	MA4075MTA	DIODE	
D462	MA4056MTA	DIODE	
D480, 481	MA165	DIODE	
D501	MA165	DIODE	
D511	RSQGP1S53V	L. E. D. (SPEED SENSOR)	
D521	LN66S	L. E. D. (DISC SENSOR)	
D522	GL480V	L. E. D. (POSITION SENSOR)	
D523	BR3433S	L. E. D.	
D531	GL480V	L. E. D. (SINGLE SENSOR)	
D601-608	MA165	DIODE	
D609	LN846RP	L. E. D.	
D620-629	SLR-332DC3F	L. E. D.	
D630, 631	MA4051MTA	DIODE	
D801, 802	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR501	EVMLGGA00B14	DISC SENSOR ADJ.	
		COMPONENT COMBINATION(S)	
R601	EXBF13E154J	COMPONENT COMB. (150kX12)	
		COIL(S)	
L11, 12	RLQX400MT-D	COIL	⚠
		TRANSFORMER(S)	
PT11	RTP1K4B027-X	POWER TRANSFORMER	(E, EB, EG, GN) ⚠
PT11	RTP1K4E033-X	POWER TRANSFORMER	(GC) ⚠
		OSCILLATOR(S)	
X401	RSXY4M23M01T	OSCILLATOR(4. 2336MHz)	

Ref. No.	Part No.	Part Name & Description	Remarks
X601	RVBCST4R00MT	OSCILLATOR(4MHz)	
		DISPLAY TUBE(S)	
FL601	RSL0209-F	DISPLAY TUBE	
		SWITCH(ES)	
S11	RSR4A003S-1H	VOLTAGE ADJ.	(GC) ⚠
S501	RSP1A017-A	LOCK DET. /MLOCK	
S502	RSH1A005	CLAMP DET.	
S503	RSH1A005	CLAMP DET. /FREE	
S601	EVQ21405R	STOP	
S602	EVQ21405R	DISC SKIP(+)	
S603	EVQ21405R	DISC SKIP(-)	
S604	EVQ21405R	PROGRAM	
S605	EVQ21405R	SINGLE PLAY	
S606	EVQ21405R	PAUSE	
S607	EVQ21405R	TRACK SKIP(F)	
S608	EVQ21405R	TRACK SKIP(R)	
S609	EVQ21405R	DIRECT	
S610	EVQ21405R	POWER	
S611	EVQ21405R	PLAY	
S612	EVQ21405R	SEARCH(F)	
S613	EVQ21405R	SEARCH(R)	
S614	EVQ21405R	GROUP ENTER	
S615	RSH1A91ZA-A	OPEN/CLOSE DET.	
S616	EVQ21405R	DISC GROUPING PLAY(A)	
S617	EVQ21405R	DISC GROUPING PLAY(B)	
S618	EVQ21405R	DISC GROUPING PLAY(C)	
S619	EVQ21405R	DISC GROUPING PLAY(D)	
S620	EVQ21405R	DISC GROUPING PLAY(E)	
S621	EVQ21405R	NUMERIC 0	
S622	EVQ21405R	NUMERIC 1	
S623	EVQ21405R	NUMERIC 2	
S624	EVQ21405R	NUMERIC 3	
S625	EVQ21405R	NUMERIC 4	
S626	EVQ21405R	NUMERIC 5	
S627	EVQ21405R	NUMERIC 6	
S628	EVQ21405R	NUMERIC 7	
S629	EVQ21405R	NUMERIC 8	
S630	EVQ21405R	NUMERIC 9	
S631	EVQ21405R	NUMERIC >10	
S633	EVQ21405R	DISC SELECTOR	
S634	EVQ21405R	DISC ENTER	
S636	EVQ21405R	ID SCAN	
		CONNECTOR(S) AND SOCKET(S)	
CN22	RJS1A6603	CONNECTOR(3P)	
CN23	RJS1A6606	CONNECTOR(6P)	
CN401	RJS1A6814	CONNECTOR(14P)	
CN402	RJS2A3332M	CONNECTOR(32P)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN404	RJS1A6603	CONNECTOR(3P)	
CN405	RJS1A6604	CONNECTOR(4P)	
CN480	RJT029W04VT	CONNECTOR(4P)	
CN501	RJS2A3332	CONNECTOR(32P)	
CN502	RJS1A6223-1	CONNECTOR(23P)	
CN503	RJT057W007-1	CONNECTOR(7P)	
CN504	RJS7T4ZA	CONNECTOR(7P)	
CN511	RJU057W007	SOCKET(7P)	
CN521	RJS7T7ZA	CONNECTOR(7P)	
CN531	SJT30344-H	CONNECTOR(3P)	
CN601	RJS1A6714	CONNECTOR(14P)	
CN602	SJS50882JQH	CONNECTOR(8P)	
CN603	SJT30845JQ	CONNECTOR(8P)	
CN604	RJT057W004-1	CONNECTOR(4P)	
CN605	RJU057W004	SOCKET(4P)	
CN606	RJT057W004-1	CONNECTOR(4P)	
CN607	RJU057W004	SOCKET(4P)	
		FLAT CABLE(S)	
FC11	REZ0898	FLAT CABLE(3P)	
FC12	REZ0899	FLAT CABLE(6P)	
FC601	REZ0831	FLAT CABLE(3P)	
		JACK(S)	
JK11	SJS9236	AC INLET	(E, EB, EG, GC) ⚠
JK11	SJSD16-1	AC INLET	(GN) ⚠
JK801	RJH3201N	LINE OUT	
		<SERVO P.C.B.>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8835SBE1	SERVO AMP	
IC702	MN662741RPA	SERVO PROCESSOR	
IC703	AN8389SE1	MOTOR DRIVE	
		TRANSISTOR(S)	
Q701	2SB709S	TRANSISTOR	
		OSCILLATOR(S)	
X701	RSXZ16M9M01T	OSCILLATOR(16.9344MHz)	
		SWITCH(ES)	
S701	RSM0006-P	REST DETECTOR	
		CONNECTOR(S) AND SOCKET(S)	
CN701	RJU035T016-1	SOCKET(16P)	
CN702	RJS1A6723-1Q	CONNECTOR(23P)	

Resistors and Capacitors

Notes: * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R11, 12	ERDS2TJ181T	1/4W 180
R13	ERDS2TJ271	1/4W 270
R14	ERDS2TJ102	1/4W 1K
R15	ERDS2TJ471	1/4W 470
R16	ERDS2TJ470	1/4W 47
R17	ERDS2TJ270T	1/4W 27
R18	ERDS2TJ151	1/4W 150
R19	ERQ16NKWR15E	1/6W 0.15 ⚠
R21, 22	ERDS2TJ122	1/4W 1.2K
R31	ERDS2TJ392T	1/4W 3.9K
R32, 33	ERDS2TJ223	1/4W 22K
R34, 35	ERDS2TJ681	1/4W 680
R36	ERDS2TJ101	1/4W 100
R41	ERDS2TJ221	1/4W 220
R43	ERD2FCVJ6R8T	1/4W 6.8 ⚠
R45, 46	ERDS2TJ221	1/4W 220
R51, 52	ERDS2TJ122	1/4W 1.2K
R409	ERDS2TJ473	1/4W 47K
R410	ERDS2TJ103	1/4W 10K
R413	ERDS2TJ103	1/4W 10K
R414	ERDS2TJ471	1/4W 470
R415	ERDS2TJ103	1/4W 10K
R416	ERDS2TJ102	1/4W 1K
R417	ERDS2TJ472	1/4W 4.7K
R418	ERDS2TJ181T	1/4W 180
R419-421	ERDS2TJ472	1/4W 4.7K
R422, 423	ERDS2TJ103	1/4W 10K
R424	ERDS2TJ104	1/4W 100K
R425	ERDS2TJ181T	1/4W 180
R431	ERDS2TJ332	1/4W 3.3K
R433	ERDS2TJ680T	1/4W 68
R454	ERDS2TJ472	1/4W 4.7K
R461	ERDS2EJ121	1/4W 120
R462	ERDS2TJ331	1/4W 330
R463, 464	ERDS2TJ821	1/4W 820
R465	ERDS2EJ121	1/4W 120
R471	ERDS2TJ103	1/4W 10K
R472	ERDS2EJ121	1/4W 120
R480	ERDS2TJ472	1/4W 4.7K
R481, 482	ERDS2TJ224T	1/4W 220K
R483	ERDS2TJ223	1/4W 22K
R484	ERDS2TJ224T	1/4W 220K
R485	ERDS2TJ223	1/4W 22K
R486	ERDS2TJ103	1/4W 10K
R501, 502	ERDS2TJ103	1/4W 10K
R503	ERDS2TJ102	1/4W 1K

Ref. No.	Part No.	Values & Remarks
R607, 608	ERDS2TJ100	1/4W 10
R610, 611	ERDS2TJ332	1/4W 3.3K
R612-614	ERDS2TJ221	1/4W 220
R615	ERDS2TJ101	1/4W 100
R803, 804	ERDS2TJ224T	1/4W 220K
R805, 806	ERDS2TJ822	1/4W 8.2K
R807, 808	ERDS2TJ123	1/4W 12K
R809-812	ERDS2TJ333	1/4W 33K
R813-816	ERDS2TJ102	1/4W 1K
R817, 818	ERDS2TJ473	1/4W 47K
R819, 820	ERDS2TJ100	1/4W 10
R851	ERDS2TJ222	1/4W 2.2K
		CAPACITORS
C11	ECBT1E103ZF	25V 0.01U
C12	ECA1CM222B	16V 2200U ⚠
C15	ECBT1H102KB5	50V 1000P
C16	ECA1AM471B	10V 470U
C17	ECEA0JKA101B	6.3V 100U
C18	ECBT1C103NS5	16V 0.01U
C20	ECBT1H102KB5	50V 1000P
C21, 22	ECA1VM101B	35V 100U ⚠
C23, 24	RCE1EM471BV	25V 470U
C30	ECBT1E103ZF	25V 0.01U
C31, 32	ECA1JM470B	63V 47U
C33	ECBT1H102KB5	50V 1000P
C41	ECBT1H102KB5	50V 1000P
C42	ECEA0JKA101B	6.3V 100U
C401	ECBT1C103NS5	16V 0.01U
C402	ECA0JM102B	6.3V 1000U
C403	ECEA1HKA010B	50V 1U
C404	ECEA1EKA4R7B	25V 4.7U
C405	ECBT1C103NS5	16V 0.01U
C406	ECBT1H391KB5	50V 390P
C407-410	ECBT1C103NS5	16V 0.01U
C421	ECBT1C103NS5	16V 0.01U
C422	ECBT1H102KB5	50V 1000P
C461	RCE1AKA470BG	10V 47U
C480, 481	ECQV1H333JM3	50V 0.033U
C482	ECBT1H470J5	50V 47P
C483	ECEA0JKA101B	6.3V 100U
C484	ECFR1E104ZF5	25V 0.1U
C501	ECBT1H221KB5	50V 220P
C601	ECBT1C103NS5	16V 0.01U
C602	ECEA0JKA101B	6.3V 100U
C603	ECEA1HKA010B	50V 1U
C604	ECFR1E104ZF5	25V 0.1U
C607	ECBT1H221KB5	50V 220P

Ref. No.	Part No.	Values & Remarks
C609	ECBT1H221KB5	50V 220P
C801, 802	RCE1AKA101BG	10V 100U
C803, 804	RCE1CKA100BG	16V 10U
C805-808	ECCR1H391J5	50V 390P
C809, 810	ECEA0JKA470B	6.3V 47U
C811, 812	ECBT1H102KB5	50V 1000P
C813	RCE1AKA470BG	10V 47U
		<SERVO P.C.B.>
		RESISTORS
R701	ERJ6GEYJ4R7V	1/10W 4.7
R703	ERJ6GEYJ823	1/10W 82K
R704	ERJ6GEYJ102A	1/10W 1K
R705	ERJ6GEYJ103V	1/10W 10K
R706	ERJ6GEYJ102A	1/10W 1K
R707	ERJ6GEYJ474V	1/10W 470K
R708	ERJ6GEYJ154V	1/10W 150K
R709	ERJ6GEYJ683V	1/10W 68K
R711	ERJ6GEYJ154V	1/10W 150K
R712	ERJ6GEYJ221V	1/10W 220
R717, 718	ERJ6GEYJ101V	1/10W 100
R721	ERJ6GEYJ101V	1/10W 100
R722	ERJ6GEYJ563V	1/10W 56K
R723	ERJ6GEYJ182V	1/10W 1.8K
R724	ERJ6GEYJ333V	1/10W 33K
R725	ERJ6GEYJ103V	1/10W 10K
R726	ERJ6GEYJ473V	1/10W 47K
R727	ERJ6GEYJ822V	1/10W 8.2K
R728	ERJ6GEYJ103V	1/10W 10K
R731	ERJ6GEYJ822V	1/10W 8.2K
R735, 736	ERJ6GEYJ101V	1/10W 100
R738	ERJ6GEYJ223V	1/10W 22K
R744	ERJ6GEYJ103V	1/10W 10K
R745	ERJ6GEYJ155V	1/10W 1.5M
R748	ERJ6GEYJ182V	1/10W 1.8K
R749	ERJ6GEYJ682V	1/10W 6.8K
R750, 751	ERJ6GEYJ473V	1/10W 47K
R752	ERJ8GEYJ220V	1/8W 22
R753	ERJ6GEYJ102A	1/10W 1K
R772	ERJ6GEYJ273V	1/10W 27K
		CHIP JUMPERS
RJ701-704	ERJ8GEY0R00A	CHIP JUMPER
RJ707	ERJ8GEY0R00A	CHIP JUMPER
RJ709	ERJ8GEY0R00A	CHIP JUMPER
RJ714-717	ERJ8GEY0R00A	CHIP JUMPER
RJ719	ERJ8GEY0R00A	CHIP JUMPER

Ref. No.	Part No.	Values & Remarks
RJ721	ERJ6GEY0R00A	CHIP JUMPER
RJ722	ERJ8GEY0R00A	CHIP JUMPER
RJ723, 724	ERJ6GEY0R00A	CHIP JUMPER
RJ726-732	ERJ6GEY0R00A	CHIP JUMPER
R714	ERJ6GEY0R00A	CHIP JUMPER
		CAPACITORS
C701	ECEA0JKA330I	6.3V 33U
C702	ECUZNE104MBN	25V 0.1U
C703	ECEA0JKA101I	6.3V 100U
C704, 705	ECUZNE104MBN	25V 0.1U
C706	ECUV1H272KBN	50V 2700P
C707	ECUV1E273KBN	25V 0.027U
C708	ECUE1H472KBN	50V 4700P
C709	ECUE1C473KBN	16V 0.047U
C710	ECUV1H182KBN	50V 1800P

Ref. No.	Part No.	Values & Remarks
C711, 712	ECUWNE104ZFN	25V 0.1U
C713	ECUV1C104MBM	16V 0.1U
C714	ECEA0JKA101I	6.3V 100U
C716	ECUE1H561KBN	50V 560P
C717	ECUWNE104ZFN	25V 0.1U
C718	ECUVNC224KBN	16V 0.22U
C721, 722	ECUV1H150JCN	50V 15P
C723	ECEA1AKA221I	10V 220U
C724	ECUV1C104MBM	16V 0.1U
C730	ECUWNE104ZFN	25V 0.1U
C731, 732	ECEA0JKA221I	6.3V 220U
C733	ECUZNE104MBN	25V 0.1U
C734	ECEA1AKA221I	10V 220U
C735-737	ECUWNE104ZFN	25V 0.1U
C738	ECUV1C154KBN	16V 0.15U
C742	ECUV1E273KBN	25V 0.027U
C743	ECUWNE104ZFN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C744	ECUE1E822KBN	50V 8200P
C745	ECUE1H102KBN	50V 1000P
C747	ECUE1H222KBN	50V 2200P
C748	ECUV1H471KBM	50V 470P
C749	ECUZNE104MBN	25V 0.1U
C750	ECUV1C104MBM	16V 0.1U
C751	ECUZNE104MBN	25V 0.1U
C752	ECUE1H152KBN	50V 1500P
C753	ECUV1H471KBM	50V 470P

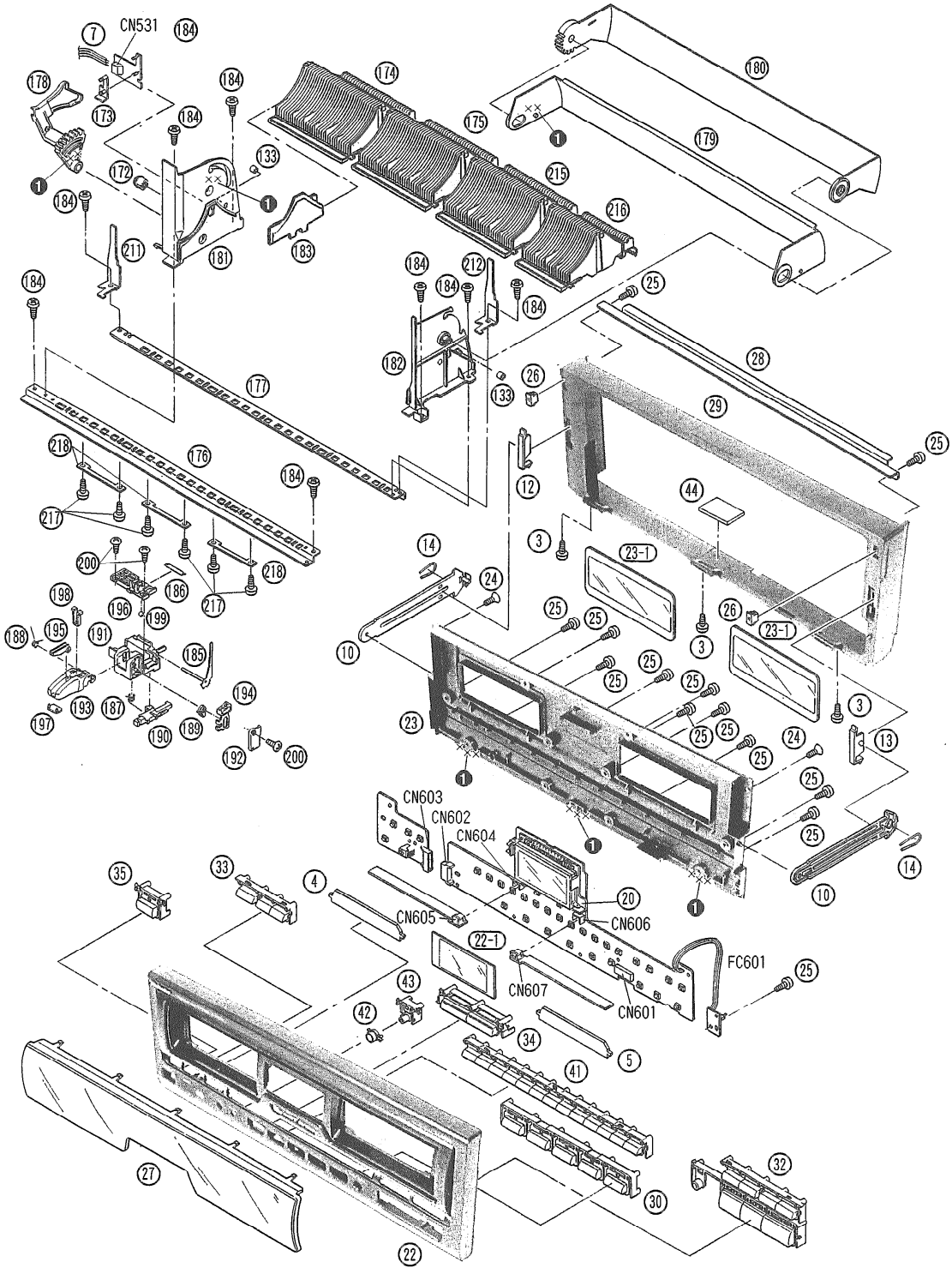
Replacement Parts List

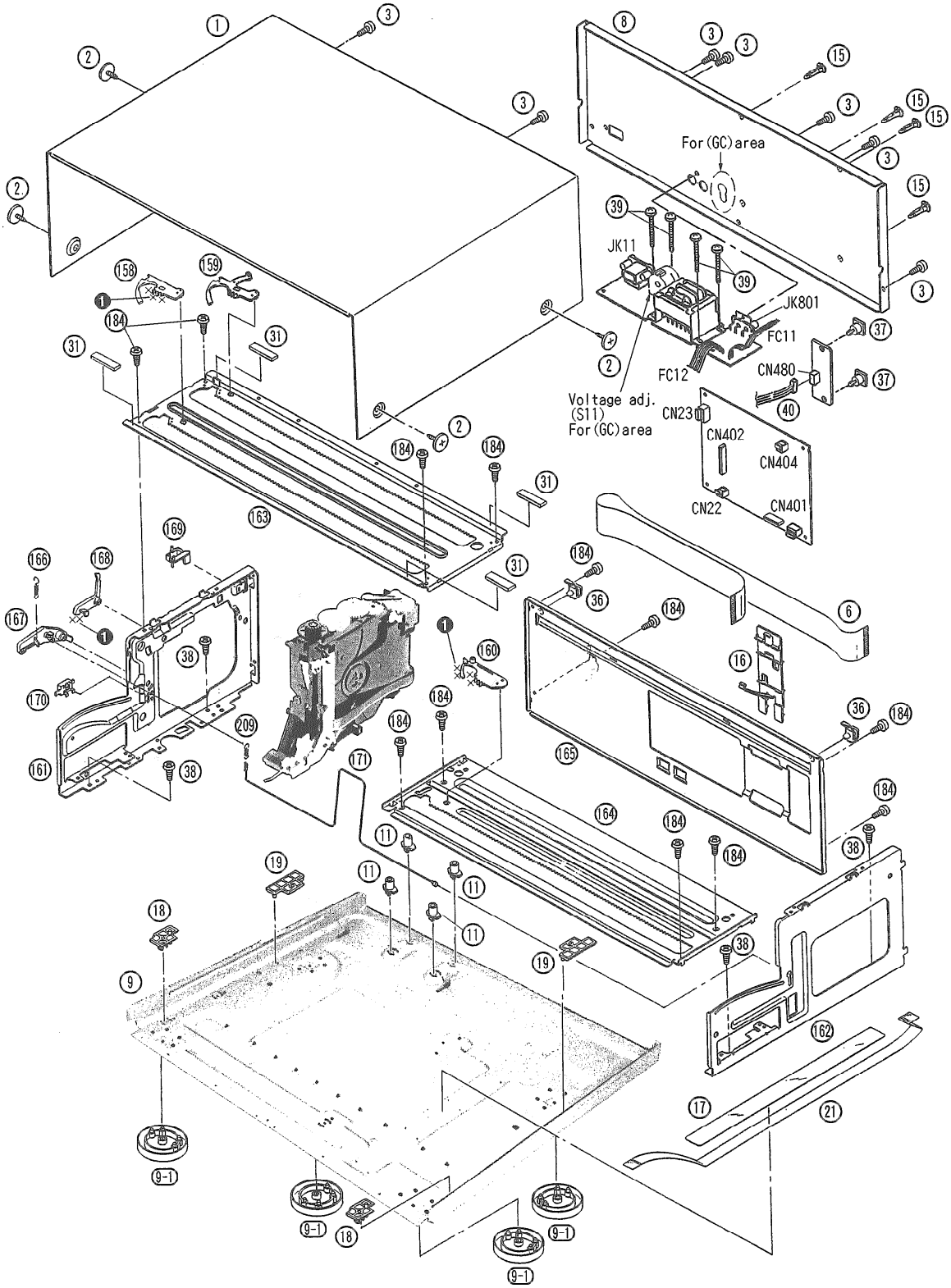
Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0314-K	CABINET	
2	SNE2129-3	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	RGL0310-Q	DISC INDICATOR(L)	
5	RGL0325-Q	DISC INDICATOR(R)	
6	REZ0837	FFC(32P)	
7	REZ0928	FLAT CABLE(3P)	
8	RGR0231A-H	REAR PLATE	(E, EG)
8	RGR0231B-A	REAR PLATE	(GC)
8	RGR0231A-J	REAR PLATE	(EB, GN)
9	RFKJLMC400PK	CHASSIS ASS'Y	
9-1	RKA0053-A	FOOT	
10	RKJ0016	SIDE TRAY	
11	RKQ0089	P.C.B.SUPPORT(P/S P.C.B.)	
12	RKQ0193-K	GRILLE COVER(L)	
13	RKQ0194-K	GRILLE COVER(R)	
14	RME0209	SIDE STAY SPRING	
15	RMN0341	P.C.B.SUPPORT(MAIN P.C.B.)	
16	RMR0950-K	MECH FFC HOLDER	
17	RMR0961-Q	FFC COVER	
18	RMX0115	MACH SPACER(A)	
19	RMX0116	MACH SPACER(B)	
20	RMN0359	FL HOLDER	

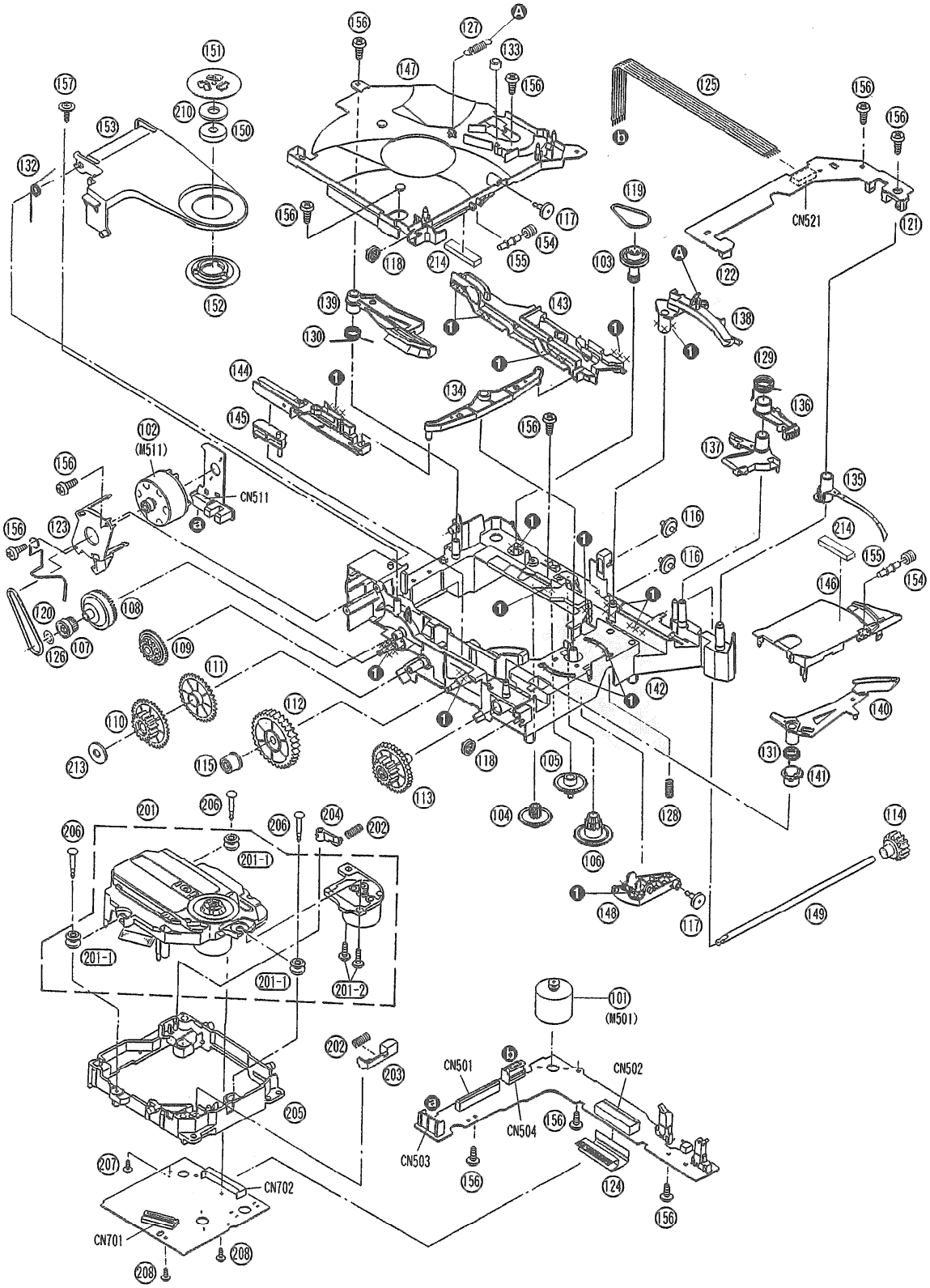
Ref. No.	Part No.	Part Name & Description	Remarks
21	REZ0830	FFC(14P)	
22	RFKGLMC400EK	FRONT PANEL ASS'Y	
22-1	RGK0778-Q	FL ORNAMENT PLATE	
23	RFKHLMC400PK	REAR PANEL ASS'Y	
23-1	RGK0777-Q1	REAR ORNAMENT PLATE	
24	RHD26023-K	SCREW	
25	RHD26024-T	SCREW	
26	RKG0009	MAGNET HOLDER	
27	RKW0425-Q	FRONT ORNAMENT PLATE	
28	RMA0918	GRILLE REINFORCEMENT PLATE	
29	RGP0515A-K	GRILLE	
30	RGU1323-1K	DISC GROUP BUTTON	
31	RMG0429-K	CUSHION RUBBER	
32	RFKNLMC50PFK	MAIN BUTTON	
33	RFKNLMC50PGK	PROGRAMMING BUTTON	
34	RFKNLMC50PHK	DISC SKIP BUTTON	
35	RFKNLMC50P1K	POWER BUTTON	
36	SHRD163	CORD HOLDER	
37	SHRD51-1	P.C.B.SPACER	
38	XTB3+10FFZ	SCREW	
39	XTB3+20JFZ	SCREW	
40	REZ0945	CONNECTOR ASS'Y(3P)	
41	RGU1324-1K	NUMERIC BUTTON	
42	RGK0534-N	ORNAMENT RING	
43	RGU1325-K1	ID SCAN BUTTON	
44	RMQ0673	GRILLE SHEET	

■ Cabinet Parts Location




For (GC) area
JK11
JK801
FC11
FC12
CN480
CN23
CN402
CN404
CN22
CN401
Voltage adj.
(S11)
For (GC) area

■ Loading Mechanism Parts



Replacement Parts List

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
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* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
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* [M] Indicates in Remarks columns parts that are supplied by MESA.
* The "(SF)" mark denotes the standard part.

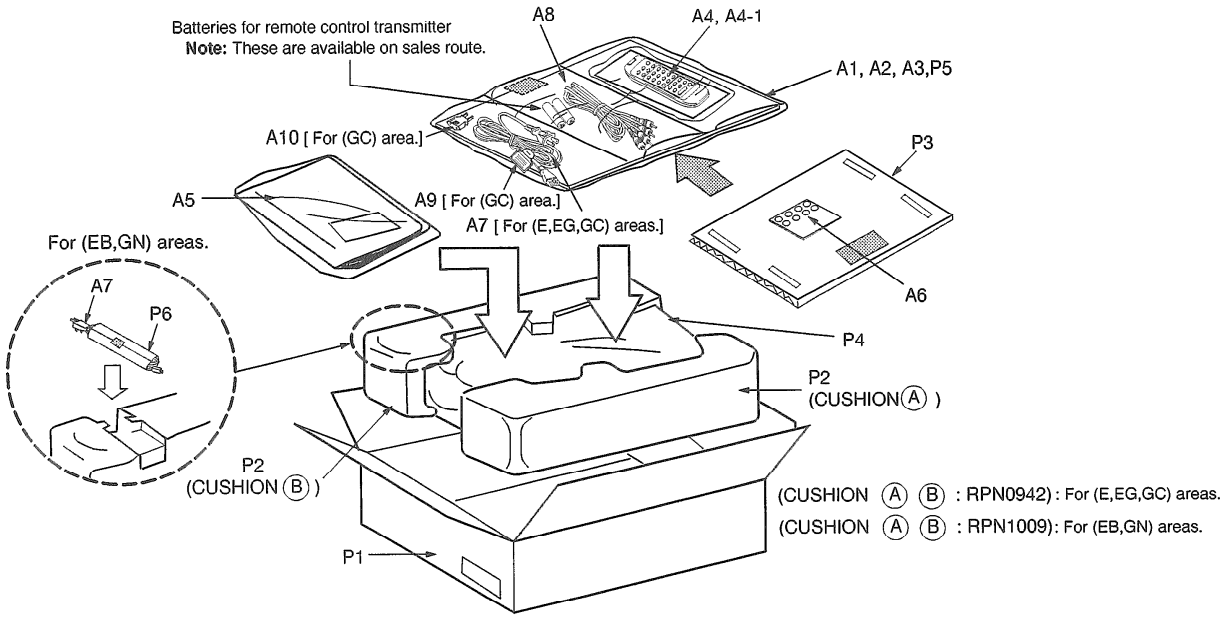
Ref. No.	Part No.	Part Name & Description	Remarks
		LOADING MECHANISM	
101	RFKPLMC50PAK	LOADING MOTOR(M501) ASS'Y	
102	RFKPLMC50PBK	SLIDE MOTOR(M511) ASS'Y	
103	RDG0336	PULLEY GEAR	
104	RDG0337	REDUCTION GEAR(A)	
105	RDG0338	REDUCTION GEAR(B)	
106	RDG0339	DRIVE GEAR	
107	RDG0340	SLIDE PULLEY GEAR	
108	RDG0341	COUNT RING	
109	RDG0342	SLIDE REDUCTION GEAR	
110	RDG0343	REAR SLEDE GEAR	
111	RDG0344	SLIDE GEAR(A)	
112	RDG0345	SLIDE GEAR(B)	
113	RDG0346	FRONT SLIDE GEAR	
114	RDG0347	LOWER SLIDE GEAR	
115	RDP0080	UPPER ROLLER	
116	RDP0081	LOWER ROLLER	
117	RDP0082	ROPE ROLLER(A)	
118	RDP0083	ROPE ROLLER(B)	
119	RDV0041	LOADING BELT	
120	RDV0046	SLIDE BELT	
121	RMN0399	SENSOR HOLDER	
122	RMN0358	LED HOLDER	
123	RMN0356	MOTOR HOLDER	
124	REZ0829	FFC(23P)	
125	REZ0832	FLAT CABLE(7P)	
126	RHW21009	WASHER	
127	RMB0453	FEED LEVER SPRING	
128	RMB0483	LOCK CANCELLATION SPRING	
129	RME0194	SUB LEVER SPRING	
130	RME0195	SIZE LEVER SPRING	
131	RME0196	RETURN LEVER SPRING	
132	RME0197	CLAMP SPRING	
133	RMG0200	CUSHION RUBBER	
134	RML0411	CONNECTION LEVER	
135	RML0412	FRONT FEED LEVER	
136	RML0413	FEED SUB LEVER	
137	RML0414	GUIDE LEVER	
138	RML0415	REAR FEED LEVER	
139	RML0416	SIZE DETECTION LEVER	
140	RML0417	RETURN LEVER(A)	
141	RML0418	RETURN LEVER(B)	
142	RFKNLMC50PBK	MECHANISM BASE ASS'Y	

Ref. No.	Part No.	Part Name & Description	Remarks
143	RMR0921-K	LOWER SLIDE PLATE	
144	RMR0922-K	UPPER SLIDE PLATE	
145	RMR0923-W	SLIDE SUPPORT PLATE	
146	RMR0924-K	DISC GUIDE(L)	
147	RMR0925-K	DISC GUIDE(R)	
148	RMR0927-K	ROLLER BASE	
149	RMS0519	CONNECTION SHAFT	
150	RHM245ZA	MAGNET	[M]
151	RMR0334	FIXED PLATE	[M]
152	RMR0761-W	CLAMPER	
153	RFKNLMC400EK	CLAMP PLATE ASS'Y	
154	RDP0091	DISC ROLLER	
155	RDP0092	GUIDE ROLLER	
156	XTBS26+10J	SCREW	
157	XTWS3+10Q	SCREW	
158	RDG0333	FRONT LOCK GEAR	
159	RDG0334	REAR LOCK GEAR	
160	RDG0374	LOWER LOCK GEAR	
161	RMA0904	SLIDE PLATE(L)	
162	RMA0905	SLIDE PLATE(R)	
163	RMA0914	UPPER RAIL	
164	RMA0915	LOWER RAIL	
165	RMA0916	REAR SUPPORT PLATE	
166	RMB0469	LOCK ARM SPRING	
167	RML0421	STAY LOCK ARM	
168	RML0436	FRONT LOCK PLATE	
169	RML0437	REAR LOCK PLATE	
170	RMR0959-K	ROPE GUIDE	
171	RMW0010	GUARD ROPE	
172	RDG0183	DAMPER GEAR	
173	RMN0388	SINGLE SENSOR HOLDER	
174	RFKNLMC50PCK	DISC STOKER(A)	
175	RFKNLMC50PDK	DISC STOKER(B)	
176	RMA0912	FRONT STOCKER STAND	
177	RMA0913	REAR STOCKER STAND	
178	RML0419	SHUTTER LEVER(L)	
179	RMR0935-K	SHUTTER INSIDE	
180	RMR0936-K	SHUTTER OUTSIDE	
181	RMR0932-K	SHUTTER SUPPORT(L)	
182	RMR0947-K	SHUTTER SUPPORT(R)	
183	RMR0948-H	STOCKER PARTITION PLATE	
184	XTB3+6F	SCREW	
185	RFKNLMC50PEK	EJECT PUSH LEVER ASS'Y	
186	RMC0291	EJECT CLICK SPRING	
187	RME0203	EJECT SLIDE SPRING	

Ref. No.	Part No.	Part Name & Description	Remarks
188	RMEO204	EJECT LEVER SPRING	
189	RMLO438	EJECT MIDDLE LEVER	
190	RMLO439	EJECT SLIDE PLATE	
191	RMRO938-K	EJECT BASE	
192	RMRO939-K	EJECT COVER	
193	RMRO940-K	EJECT LEVER	
194	RMRO941-H	EJECT BUTTON	
195	RMRO943-H	EJECT HOLD LEVER	
196	RMRO958-K	EJECT GUIDE	
197	RMRO964-K	EJECT PAD(A)	
198	RMRO965-K	EJECT PAD(B)	
199	SFYB5-32	STEEL BALL	
200	XTN2+6JFZ	SCREW	
201	RAE0150Z	TRAVERSE DECK ASS'Y	⚠
201-1	SHGD113-1	FLOATING RUBBER	
201-2	SNSD38	SCREW	
202	RMBO455	FRONT SUPPORT SPRING	
203	RMLO423	FRONT SUPPORT ARM	
204	RMLO424-1	REAR SUPPORT ARM	
205	RMRO937-K	TRAVERSE CHASSIS	
206	RMSO123-1	TRAVERSE FIXED PIN	
207	XTN2+6G	SCREW	
208	XTV2+6G	SCREW	
209	RMBO454	GUARD ROPE SPRING	
210	RMAO989	BACK YOKE	
211	RMLO420	SHUTTER LEVER(R)	
212	RMA1006	SHUTTER LEVER PLATE	
213	RHW42002	WASHER	
214	RMFO237-1	GUIDE FELT	
215	RFKNLMC400PA	DISC STOCKER(C)	
216	RFKNLMC400PB	DISC STOCKER(D)	
217	RHD20047-K	SCREW	
218	RMAO995	STOPPER	
		PACKING MATERIAL	
P1	RPG2727	PACKING CASE	
P2	RPNO942	CUSHION	(E, EG, GC)
P2	RPN1009	CUSHION	(EB, GN)
P3	RPQO164	PAD	
P4	SPP730	PROTECTOIN BAG(UNIT)	
P5	RPFO139	PROTECTION BAG(F.B.)	
P6	RPHDO32	MIRROR SHEET	(EB, GN)
		ACCESSORIES	
A1	RFKSLMC400EK	INSTRUCTION MANUAL ASS'Y	(E)
A1	RFKSLMC400EB	INSTRUCTION MANUAL ASS'Y	(EB, GN)
A1	RQT3181-D	INSTRUCTION MANUAL	(EG)
A1	RQT3183-G	INSTRUCTION MANUAL	(GC)
A2	RQAO117	WARRANTY CARD	(E, EB, EG)
A2	RQX7433ZA	WARRANTY CARD	(GN)

Ref. No.	Part No.	Part Name & Description	Remarks
A3	RQCB0169	SERVICENTER LIST	
A4	RAK-SL186WH	REMOTE CONTROL TRANSMITTER	
A4-1	RKKO057-K	BATTERY COVER	FOR R/C TRANSMITTER
A5	RFAO623-K1	NOTEBOOK-LIKE BINDER	
A6	RQLAO326	ADHESIVE NUMBER	
A7	RJAO019-2K	AC POWER SUPPLY CORD	(E, EG, GC)⚠(SF)
A7	RJAO049-K	AC POWER SUPPLY CORD	(EB)⚠
A7	RJAO036-K	AC POWER SUPPLY CORD	(GN)⚠(SF)
A8	SJP2249-3	STEREO CONNECTION CABLE	
A9	RQLAO134	VOLTAGE CAUTION LABEL	(GC)
A10	SJP5213-2	POWER PLUG ADAPTOR	(GC) ⚠
		<GREASE OR JIG/TOOL>	
		GREASE	
SA1	RFKXPG671	MORYCOAT GREASE PG671	
SA2	SZZOL24	FLOIL GREASE	
		ALLEN WRENCH	
SA3	SZZP1101C	ALLEN WRENCH(M2.0)	
		EXTENTION	
SA4	RFKZO062	EXTENTION CORD	
		TEST DISC	
SA5	SZZP1054C	PLAYABILITY TEST DISC	
SA6	SZZP1056C	UNEVEN TEST DISC	

Packaging



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